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Psychological Reactions of Turkish Earthquake Survivors

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Psychological Reactions of Turkish Earthquake Survivors

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Dedication

To the Memory of My Parents, Şükran and Mehmet Erdur,

and My Husband, Derek K. Baker

Psychological Reactions of
Turkish Earthquake Survivors

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The goal of this study was to examine DSM's posttraumatic stress disorder's (PTSD) symptom structure in relation to Turkish earthquake survivors and to examine the strength of associations of several risk/resilience variables with PTSD. In addition, the aim of the study was to look at the diagnostic features and development of PTSD in a culture specific context, because most of the knowledge on trauma and emotional experiences were produced based on western cultural premises and then imported to other international cultures. Confirmatory factor analysis was utilized to test the symptom structures of PTSD and the three symptom clusters (avoidance/numbing, reexperiencing, and arousal) of PTSD reported in DSM-IV failed to be confirmed. Exploratory factor analysis was conducted to find the best-fitting factor structures for Turkish earthquake survivors. The data for the factor analyses were gathered from 440 Turkish earthquake survivors six weeks after the 1999 Istanbul earthquake. The risk and/or resilience variables (level of exposure,

rumination, emotion regulation, and meta-mood traits) were examined in terms of their relationships with PTSD using data gathered from 157 Turkish survivors approximately two years after the earthquake. Multiple hierarchical regression analyses were utilized to test the strength of associations between PTSD and the following variables: level of exposure, age, gender, types of emotion regulation (suppression and reappraisal), rumination, and meta-mood traits (clarity in discriminating feelings, attention to feelings and mood repair). Level of exposure, suppression, rumination, clarity in discriminating feelings and mood repair are found to be related to the development of PTSD. Results are discussed in light of the existing literature, and limitations and directions for future studies are drawn.

Table of Contents

CHAPTER I

Introduction

There is no place on earth that is immune from natural disasters, and millions of people are being killed or are suffering because of these disasters each year. Natural disasters differ from human made disasters because natural disasters are unpredictable, uncontrollable, instantaneous, concentrated, and unexpected (McCaughey, Hoffman, and Llewellyn, 1995). Furthermore, natural disasters affect the economic, social, medical, and psychological well being of not only individuals, but also whole communities. The psychological impacts from natural disasters are frequently overlooked, as attention immediately after a disaster is only focused on meeting essential material needs, such as food, water, sanitation, shelter, medical assistance, and communication (Revel, 1996).

The most obvious symptoms manifested by the survivors of natural disasters are hypervigilence, hypersensitivity, recurrent and intrusive recollection of the event, distressing dreams, intense psychological stress at exposure to internal and/or external cues, and physiological reactions on exposure to cues. Fears of darkness, loud noises, smoke, and strangers are common. Feelings are dulled and interest in daily activities is diminished. People do not believe in the future. Also, sleep disturbance, loss of appetite and irritability are often reported by survivors. Anger, frustration, confusion, a sense that life is meaningless, and survivor guilt are most disturbing to these people. Also, expressions of death anxiety consisting of vivid memories and images of the dying and massive destruction caused by the natural disaster are widely reported.

Within the previous research that compiles survivors' reactions to trauma, substantial agreement and validation exist that PTSD is a commonly seen psychological problem among trauma survivors. DSM-IV clusters 17 PTSD symptoms into three groups: reexperiencing, avoidance/numbing, and arousal. Even though DSM's PTSD formulization has been validated and widely used to generate a specific diagnosis, several problems have concerned trauma researchers in terms of the components of the three symptom clusters, which are criterion B (reexperiencing), criterion C (avoidance/numbing) and criterion D (arousal).

Several factor analytic studies have examined the fitness of the symptom structure of PTSD to different populations with different traumatic experiences. None of the factor analytic studies reviewed for the present study confirms the components of the PTSD symptom clusters reported in DSM-IV. In other words, previous factor analytic studies reported different factor structures for different populations with different traumatic experiences. Most of the researchers suggested that avoidance and numbing might not be seen at the same time (e.g., McMillen, North, and Smith, 2000) and they should be separate clusters. It is also discussed that the construct of avoidance needs further clarification. For example, Anthony, Lonigan, and Hecht (1999) make a distinction between active avoidance (e.g., avoiding trauma related thoughts by engaging in distractive activities and social interactions) and passive avoidance (withdrawal from any activities). Some factor analytic studies found that avoidance may be highly correlated to arousal whereas others found that avoidance is correlated with reexperiencing symptom clusters. It was widely discussed that criterion C (avoidance/numbing) might be too stringent. The numbing response was found to be less common for particular types of traumatic events, such as natural

disasters, where survivors are more likely to receive social support (e.g., Davidson and Foa, 1991).

Furthermore, a substantial amount of research has been conducted to understand who is more susceptible and who is more resilient to trauma. Yet inconsistent findings are reported so far. Variables such as age, gender, social support, type of loss, and types of coping skills and their relationships with PTSD have been widely studied. However, some underlying factors for survivors' emotional and cognitive experiences have been overlooked. As underlying mechanisms of emotional and cognitive experiences, rumination, expressive/suppressive style, and meta-mood traits have been examined individually as key variables for depression and anxiety. However, the literature on these underlying mechanisms and their associations to PTSD is still in its infancy. These variables are of interest in the present study because survivors with PTSD experience two distinct types of emotion problems: intense negative emotional reactions, and disinterest in circumstances that would otherwise elicit emotion and a lack of ability to experience and express emotions (Litz, Orsillo, Kaloupek, & Weathers, 2000). Clarification of the associations between PTSD and the cognitive and emotional variables has the potential to explain the underlying mechanisms of these two very distinct emotional problems that from which trauma survivors suffer.

Several conceptual models are presented to explain traumatic reactions. Among them, the cognitive theories seem the most promising in terms of explaining the cognitive and emotional experiences of trauma survivors. For this study, several cognitive and emotional processing models are integrated to explain posttraumatic reactions. These models suggest that traumatic experiences confront the person with

information that is highly discrepant from previous cognitive beliefs about the self and the world. Individuals attempt to integrate the threat-related information, but these attempts require a lot of confrontations that create severe distress and, therefore, a strong desire to avoid or escape. However, until this information is assimilated and integrated into the survivor's existing views of the world, it will remain in the active memory and will continue to produce intrusive and emotionally upsetting recollections. Also, ironically, since this attempt at suppression creates a monitoring process, it might increase the automatic activation of the thoughts or emotions that are trying to be suppressed (Wegner, 1994). These integration and assimilation processes can be facilitated or hindered by some personality traits such as rumination, emotion regulation styles, and beliefs and attitudes about emotional experiences. However, the strength of the associations between PTSD and all these variables together has not been understood.

This study aims to examine the symptom structures of PTSD for Turkish earthquake survivors and to investigate the relationships between level of exposure, age, gender, educational level, rumination, and emotional experiences (emotion regulation and meta-mood traits) and PTSD. These variables are of interest to this study because their impact on international survivors' traumatic reactions to natural disasters has not been studied. Moreover, these variables were previously examined independently using different types of samples (such as all women or all men) that were exposed to different types of traumatic events, (such as sexual assault, war, or a traffic accident). In some cases, research participants were not trauma survivors at all; rather participants' reactions were assessed in an artificially created stressful situation.

In the literature review section, the characteristics of natural disasters and their differences from human-made trauma, and the features of PTSD and its symptom structures are summarized. Later, cognitive and emotional processing theories are introduced in relation to rumination, emotion regulation (suppression and reappraisal), and meta-mood traits (clarity in discriminating feeling, attention to emotional experiences, and mood repair).

In order to reach the research goals, two data sets were analyzed. The first data set, collected by Dr. Kalayjian six weeks after the August 1999 Istanbul earthquake, consists of 440 participants who responded to the Reaction Index Scale (RIS), a measure of posttraumatic symptoms, and a brief demographic questionnaire. These data were used to examine the symptom structures of PTSD by confirmatory and exploratory factor analyses.

The second data set was gathered during January and February 2002. This second data set includes 157 participants who responded to the RIS, The Emotion Regulation Scale, The Distress From Earthquake Scale, The Meta-Mood Traits Scale, and a questionnaire measuring overall distress reactions (SCL-R). Several multiple hierarchical regression models were tested to identify the strength of associations between PTSD and age, gender, level of exposure, rumination, emotion regulation, and meta-mood traits.

The results of the study are presented in Chapter 4. The confirmatory factor analysis failed to confirm the components of symptom clusters of PTSD as reported in DSM. The results of the exploratory factor analysis suggest a new three symptoms cluster for the sample (reexperiencing/arousal, cognitive impairments, and numbing). Hierarchical regression analysis revealed significant relationships between PTSD and

level of exposure, rumination, suppression, clarity in discriminating feelings, and mood repair as hypothesized. However, age, gender, reappraisal, and attention to emotional experiences were not found to be associated with PTSD. These results are discussed in light of the related literature and the limitations of the study are presented in the Chapter 5.

CHAPTER II

Literature Review

2.1 NATURAL DISASTER STUDIES

Each year 100,000 to 1,000,000 earthquakes happen around the world (McCaughey, Hoffman, & Llewellyn, 1995). Statistically calculated trends covering the last two decades indicate that both the number and the magnitude of the effects of natural disasters have been increasing and will continue to increase at a rapid rate in the near future (Kalayjian, 1995). The World Health Organization (WHO) estimates that between the years 1964 and 1983, natural disasters throughout the world killed nearly 2,500,000 people and left an additional 750,000,000 people injured (PAHO, 1993; in Kalayjian, 1995). Furthermore, these disasters affect the economic, social, medical, and psychological well-being of the communities in which they occur.

The affects of natural disasters are seen at the individual, family, community, and national level. Kalayjian (1995) classifies the types of losses due to natural disasters into three types. The first type of loss is called direct loss, which includes a decrease in environmental safety and physical damage, such as victims' injuries and damage to the infrastructure of public services, hospitals, industry, and commerce. The second type of loss is called indirect loss, which includes the social and economic effects of a disaster. Examples of this second type of loss are damages to transportation, communication, and media infrastructures in the social area, and damages to the economy, trade, production, and tourism in the economical area. The third type of loss is called undetected loss, which refers to damages that cannot be

identified at the time of the disaster or immediately afterwards. These damages can be the loss of a community's cohesion, continuity, harmony, positive self-image, and historical documents. The monetary value of these undetected losses is difficult to calculate or measure.

A devastating natural disaster occurred in Turkey on August 17, 1999, when an earthquake registering 7.4 on the Richter scale hit the northwest part of Turkey, centering on the cities of Istanbul, Golcuk, Izmit, Adapazari, Yalova, and Kocaeli. This area is the industrial heart of Turkey and historically the most attractive area for domestic immigrants, and therefore is the most populated area. The worst part of this devastating earthquake was that it hit at 3:01 a.m. when the victims were at home sleeping. People were buried alive in collapsing apartment buildings. On November 13, another earthquake registering 5.8 in magnitude hit the same area. This earthquake caused already damaged buildings to collapse and injure people. This time, many of the deaths were due to heart attacks, and many people jumped in panic from their windows and balconies. Official estimates of the death toll for the first earthquake were in excess of 17,000, while 1.5 million people were made homeless. This earthquake was classified as one of the six deadliest earthquakes of the century (Newsweek, 1999).

Earthquakes may be the scariest of the different types of natural disasters due to their unpredictable nature. Predictions of time, location, and intensity are limited to the crudest estimates, which leads to feelings of helplessness.

Revel (1996) examines the numerous definitions of disasters that can be found in the literature, and reports that a helpful operational definition is as follows:

> Environmental disruption exceeds the adjustment capacity of the affected community, thus requiring external assistance. It may apply to natural

> disasters and accidents, to communities as well as to individuals. It also works for physical events as well as psychological stress or trauma, in which the overwhelming calls for an external assistance through various symptoms (p.290).

McCaughey, Hoffman, and Llewellyn (1995) summarize the eight characteristics of an earthquake as follows: 1) unpredictable (unknown when one will occur); 2) instantaneous (sudden death, injury and destruction); 3) concentrated (high velocity destructive evolution); 4) uncontrollable (its acute effects cannot be modified); 5) powerful (causes a wide area of destruction); 6) elusive (cause is unseen; only the effects are seen); 7) total involvement (encompassing all senses); and, 8) unexpected continuation (aftershocks cause vigilance).

Revel (1996) summarizes that the number of people affected by natural disasters is increasing. To say that natural disasters are among the main causes, if not the main cause, of traumatic stress in the world is not an overstatement. This point is frequently overlooked, as the attention immediately after a disaster is focused only on meeting the most essential material needs, such as food, water, sanitation, shelter, medical assistance, and communication, and not on essential psychological needs.

2.2 Psychological Reactions to Natural Disasters

The responses to traumatic events can be seen as behavioral and psychological. Holloway and Ursano (1984) suggest that these responses are not random, rather they have a predictable structure, and time course and posttraumatic symptoms are transitory for most survivors; however, the effects of a disaster linger long after its occurrence and regenerate due to new experiences that remind the person of the past traumatic events (Green & Solomon, 1995).

Mass natural disasters differ from other types of traumatic events primarily due to the total destruction of the physical and social environments. After a major earthquake, for instance, survivors cannot go back to their previous environment because their houses may have collapsed, their family members and/or neighbors may have been killed, and their whole community may have been disrupted (Kowalski & Kalayjian, 2000). In disaster situations, people feel completely overwhelmed. The survivors' lives are threatened, and even if they are not physically affected, they are subject to intense stress.

The American Red Cross Manual on Disaster Health Services I (1992) defines five stages that survivors of disaster are likely to experience.

1. Initial impact stage: The survivors experience increased anxiety and fear.
2. Heroic stage: The survivors display altruistic behaviors. They help each other anyway that they can.
3. Honeymoon stage: The survivors at this stage are happy that they survived. They feel that they are special and important, especially as they receive special attention and aid from domestic and/or international governments, private organizations and so on.
4. Disillusionment stage: At this stage the survivors experience increased resentment, frustration, and anger at officials and agencies for failing to provide assistance in a more timely manner.
5. Reconstruction and acceptance stage: The survivors start planning to reconstruct their life and accept the need of taking some responsibility for personal problems.

These stages are not linear and they may overlap. Also, the amount of time spent in each stage may be different from one person to another (Kowalski & Kalayjian, 2000).

Shore, Tatum, and Vollmer (1999) state that there are at least three types of interpretative approaches to disaster research: 1) the psychiatric approach, which attempts to define the extent to which disaster victims have suffered from significant mental illness; 2) the behavioral approach, which focuses on behavioral responses to disaster as a group process and social adaptation to disaster stress, assuming minimal negative mental health consequences to individuals; and, 3) interpersonal network approach, which stresses the disruption of interpersonal and social linkages and the use of support systems in response and recovery.

Shore, Tatum, and Vollmer's (1999) study of the Mount St. Helen volcanic eruption disaster experience on May 18, 1980, uses the psychiatric approach and therefore their goal is to emphasize the significance of stress-induced psychiatric disorders among disaster victims. They interviewed a total of 1,025 people 42 months after the disaster and categorized the people into three groups: high exposure, low exposure, and control. By using the Diagnostic Interview Schedule, they defined three major psychiatric disorders that were manifested in the high and low exposure group: single-episode depression, generalized anxiety disorders, and 'Mount St. Helens-related' posttraumatic stress disorder. Their findings reveal significant differences in subsequent psychiatric morbidity among these three groups when exposed to varying levels of disaster stress. These differences are reflected in the differential onset of the three specific psychiatric disorders. The observed onset pattern is consistent with a dose-response relationship to disaster stress and is related to property loss or death of

a family member or close relative due to the disaster. The people in the high exposure group are found to be more vulnerable to developing further traumatic stress.

Similar emotional reactions to mass disaster are reported by Jones (2000) after the 1994 bombing of a federal building in Oklahoma City, Oklahoma. The most obvious symptoms manifested by the survivors of this event were hypervigilence, hypersensitivity, recurrent and intrusive recollection of the event, distressing dreams, intense psychological stress at exposure to internal and/or external cues, and physiological reaction on exposure to cues. Fears of darkness, loud noises, smoke, and strangers were common. Feelings were dulled and interest in daily activities was lost. People felt hopeless about the future. Sleep disturbance, loss of appetite and irritability were often reported by survivors. Anger, frustration, confusion, a sense of life being meaninglessness, and survivor guilt were affecting these people.

Lifton and Olson (1999) interviewed 43 victims of the Buffalo Creek disaster and reported that people who were exposed to this disaster displayed some or all of the following reaction patterns. The first pattern identified was called death imprint and related death anxiety. Expressions of death anxiety consists of vivid memories and images of the dying and massive destruction, anxiety and fear related to these memories and images, sleep disturbances, fear of crowds, and terrifying dreams that occurred regularly even 27 months after the disaster. According to most victims, this type of death and being vulnerable to this type of death was unacceptable. Their surrounding environment was threatening and deadly rather than life sustaining.

The second pattern identified was called death guilt. Death guilt was painful "self-condemnation over having lived" while others died. Even 30 months after the disaster, victims reported that they could or should have saved other people who died.

However, this feeling is usually accompanied by feelings of relief and gratitude that they survived. Perhaps, because of this feeling of gratitude, the survivors never forgave themselves for having survived; rather they may have suppressed this feeling of relief and/or replaced it with other emotions such as rage and apathy.

The third pattern identified was psychic numbing, which the authors claim may be the most universal reaction to a disaster. The psychic numbing response is also called the "disaster response." When affected by psychic numbing, people suppress all feelings and may be in a state of withdrawal and depression. The common responses related to psychic numbing for the survivors of the Buffalo Creek disaster were memory lapses, general sluggishness, unresponsiveness, and confusion about details of one's immediate surroundings and the passage of time in general.

The fourth pattern identified was impaired human relationships, and consists especially of need and nurturing conflicts as well as strong suspicions of the counterfeit. According to the authors, it was clear that the Buffalo Creek victims were craving human support and comfort but at the same time they were unable to relate to other people. They were often full of rage and hostility.

The fifth pattern identified was the struggle to understand the significance and meaning of the disaster. This pattern was a search for the reasons and answers to why questions. The authors discussed that in most natural disaster situations, people might attribute the disaster to God's will or their sin, but in the Buffalo Creek case people reasoned that God had nothing to do with it. The Buffalo Creek disaster was not caused by nature, but by man. The survivors believed that a small number of people were responsible for the collapse of the dam.

This fifth pattern makes it clear that there are differences between human-made and natural disasters in terms of people's understanding or interpretation of the traumatic events. Lifton and Olson's (1999) discussion in this sense is very significant in terms of how Buffalo Creek disaster survivors felt about the cause of this disaster. Survivors believed that their lives meant nothing to the company that ran the dam. In the case of human-made disasters such as war, airplane crashes, personal assaults and so on, the survivors' sense of self worth and dignity were undermined. One of the Buffalo Creek survivors stated, "we were less than human in the eyes of the company."

In the case of natural disasters, the traumatic event affects the whole community. After the disaster, the presence of other survivors "sharing the same fate and reacting in a similar fashion helps to validate one's own assessments and judgments" (Kaniasty & Norris, 1999; p.29). Several researchers (e.g., Dynes & Drabek, 1994; Taylor, 1991) discussed that contrary to reports by the media and psychological professionals, survivors of mass disasters tend to regain their rational thinking and sense of determination rather quickly. They immerse themselves in the process of helping others. Survivors often do not have time for their own crises. Kaniasty & Norris (1999) observe "as long as they are physically capable, they rush to help others; victims are doers –there is no place for bystanders." (p.29). Butcher and Dunn (1989) explain that being around other survivors contributes to the recovery process. Victims who are isolated from others will more likely develop psychopathologic reactions. Perhaps being part of a group is less threatening and confusing, and thus more tolerable, and triggers less existential questions in terms of justice and fairness in the world (Kaniasty & Norris, 1999).

Several researchers also talk about the positive effects of traumatic events. Raphael and Wilson (1993) state that exposure to trauma can help people move toward health and that individuals may rearrange their values and reprioritize their life goals, with an emphasis on the importance of family, friends, and country (Ursano, Fullerton, & Norwood, 2000). Kalayjian (1995) also states the positive changes that are seen after natural disasters: "rebirthing experience, rebuilding of communities destroyed or otherwise damaged, developing newer and healthier coping skills, adopting a new and more positive meaning in life, helping one another in organized volunteer efforts, taking steps towards prevention or reducing the impact of disaster, and experiencing existential growth" (p.25).

Salzer and Bickman (1999) support the idea that contrary to 'disaster myths', which describes survivors of a disaster as irrational, in shock, panicking, and dependent on external aids, disaster survivors do organize very quickly to help each other and show heroic/altruistic behaviors following a disaster without any sign of shock and dependency. However, they also point out the research findings that report increased psychological stress and psychopathology after disasters. Their review of previous research (Green, Wilson, & Lindy, 1985; Durkin, Khan, Davidson, Zaman, & Stein, 1993) concludes that the emergence of "PTSD symptomatology should not be surprising, given that they are viewed as natural reactions to traumatic events and should not be considered aberrant or pathological unless they significantly interfere with normal functioning" (p. 66).

Other important points that Salzer and Bickman (1999) make concern the way that disaster research is designed, the longevity of psychological distress following disasters, and the impact of natural versus human-made disasters. They point out that

lower effect sizes in terms of the disaster-psychopathology relationship will likely be found when powerful comparison-group and actual pre-post designs are used. For instance, effect sizes were found to be lower when researchers used the same measure for their pre-post designs and pre-testing was done before the disasters, as opposed to asking participants to remember their functioning before the disaster. In these cases, participants are more likely to be biased about their functioning. Pre-event data has a critical impact on determining the effects of disasters. Several studies that obtained data on the psychopathology of survivors before a disaster suggested that disasters are more likely to contribute to the severeness of an existing psychopathology than to create a new psychopathology (Smith, Robins, Przybeck, Goldring, & Solomon, 1986). Similarly, lower effect sizes are found for longer time periods between pre and post measures. Rubonis and Bickman (1991) reported a negative relationship between the length of time (between the disaster and measure) and effect size estimates. The severity of the traumatic effects were found to decrease over time (Freedy, Saladin, Kilpatrick, Resnick, & Saunders, 1994); however, a reverse relationship was found for human-made disasters (Baum & Davidson, 1985).

In summary, the existing research reports both positive and negative impacts for disasters. The studies indicate the difficulties of conducting research in disaster areas and the inconsistencies in the literature resulting from different researchers using different methodologies. Clearly, all survivors of traumatic events manifest psychological problems to some degree; however, not all of these problems are pathological. Some people also report positive benefits, such as learning important lessons and identifying more fulfilling life goals. However, survivors do tend to be more susceptible to further trauma, especially when faced with another source of

stress in their life. Several trauma related psychological problems are reported as common psychiatric responses to disasters, such as major depression, substance abuse, generalized anxiety disorder, adjustment disorders, acute stress disorders, grief reactions, family violence, and the symptoms of posttraumatic stress disorder. Any extraordinary stressor such as war, physical and/or sexual assault, accidents, a natural disaster and a human-made disaster can cause these traumatic reactions. Van der Kolk, Hart, and Burbridge (1995) state that

> mirroring the confusion and disbelief of people whose basic assumptions are shattered by traumatic experiences, the psychiatric profession periodically has been fascinated by trauma, followed by sudden disbelief in the importance of trauma in the genesis of psychopathology (p.1).

2.3 POSTTRAUMATIC STRESS DISORDER

2.3.1 Clinical Definition of Posttraumatic Stress Disorders

One of the main focuses of this study is identifying the symptoms of posttraumatic stress disorder. The survivors of traumatic events commonly report PTSD symptoms and the PTSD diagnosis is commonly given by mental health professionals nationally and internationally. As a result of documentation from a large amount of research, posttraumatic stress disorder was just recently included in DSM-III and DSM-IV as a separate disorder. It is important to note that this inclusion was seen as an important milestone in the field due to the social and political implications for many trauma survivors. Yehuda and McFarlane (1995) stated that the inclusion of PTSD in DSM aided efforts to develop a model that might provide more sophisticated formulizations about the experiences of traumatized individuals.

DSM-IV describes the essential features of posttraumatic stress disorder as follows:

…the development of characteristic symptoms following exposure to an extreme traumatic stressor involving direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to one's physical integrity; or witnessing an event that involves death, injury, or a threat to the physical integrity of another person; or learning about an unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or other close associate (p.424).

Six diagnostic criteria for posttraumatic stress disorder are listed in DSM-IV:

A. The person has been exposed to a traumatic event in which both of the following were present:

   1. the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to physical integrity of self or others

   2. the person's response involved intense fear, helplessness, or horror. Note: In children, this may be expressed instead by disorganized or agitated behavior.

B. The traumatic event is persistently reexperienced in one (or more) of the following ways:

   1. recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. Note: In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.

   2. Recurrent distressing dreams of the event. Note: In children, there may be frightening dreams without recognizable content.

   3. Acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those

that occur on awakening or when intoxicated). Note: In young children, trauma-specific reenactment may occur.

C. Persistent avoidance of stimuli associated with trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:

1. efforts to avoid thoughts, feelings, or conversation associated with the trauma
2. efforts to avoid activities, places, or people that arouse recollections of the trauma
3. inability to recall an important aspect of the trauma
4. markedly diminished interest or participation in significant activities
5. feeling of detachment or estrangement from others
6. restricted range of affect (e.g., unable to have loving feelings)
7. sense of foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life span)

D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:

1. difficulty falling or staying asleep
2. irritability or outbursts of anger
3. difficulty concentrating
4. hypervigilnace
5. exaggerated startle response

E. Duration of the disturbance (symptoms in Criteria B, C, D) is more than 1 month.

F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

Specify if:

- Acute: if duration of symptoms is less than 3 months
- Chronic: if duration of symptoms is 3 months or more

Specify if:

- With Delayed Onset: if onset of symptoms is at least 6 months after the stressor.

Several researchers noted two main concerns regarding the PTSD diagnosis. First, although criterion A states that exposure to the traumatic event is a criterion for PTSD, many people do not manifest pathological symptoms after a traumatic event. McMilllen, North, and Smith's (2000) reviewed the literature on the rates of diagnosable PTSD cases and found that these rates vary from one traumatic event to another. According to their review, the lowest rates of PTSD measured by structured diagnostic interview schedules were around 4 to 8% of those affected by natural disasters such as floods, volcanoes, mud slides, and tornadoes. The highest rates of PTSD were from 29 to 54% of those affected by technological accidents, rape cases, and criminal disasters that entailed large numbers of fatalities and exposure to grotesque scenes. Thus, exposure to traumatic events by itself may not cause psychological problems.

Second, several researchers raised questions about the validity of the PTSD symptom structures reported by DSM: reexperiencing (criterion B),

numbing/avoidant (criterion C), and arousal (criterion D). These symptom structures of PTSD were investigated in terms of their fit to different types of traumatic events and populations, and their results combined with other clinical observation efforts indicate substantial agreement in terms of the manifestation of the 17 symptoms that cluster into three groups (e.g., Horowitz, Wilner, Kaltreider, & Alvarez, 1980; Cordova, Studts, Hann, Jacobsen, & Andrykowski, 2000; McMillen, North, & Smith, 2000). However, inconsistent results were reported regarding the components of the reexperiencing (criterion B), numbing/avoidant (criterion C), and arousal (criterion D) and their applicability to different populations and to different types of trauma experiences (e.g., Anthony, Lonigan, Hecht, 1999).

Since most diagnostic tools were developed based on DSM's formulation of PTSD, factor analysis has been widely used to test the PTSD symptom clusters (e.g., Buckley, Blanchard, & Hickling, 1998; Silver & Iacono, 1984; Vreven, Gudanowski, King, & King, 1995; Cordova, Studts, Hann, Jacobsen, and Andrykowski, 2000). For example, King, Leskin, King, and Weathers (1998) examined the factor structures of the Clinician-Administered PTSD Scale developed based on DSM's conceptualization of PTSD with a sample of 524 male military veterans and concluded that a four factor structure model of re-experiencing, effortful avoidance, emotional numbing, and hyper arousal is the best fit model instead of DSM's three factor structure. However, Steven, Klaus, Koch, Crockett, and Passey (1998) reported two factors (intrusions/avoidance and hyperarousal/numbing) as a result of their exploratory factor analyses of 103 motor vehicle accident victims and 419 UN peacekeepers in Bosnia. Their results were confirmed by confirmatory factor analysis of 217 motor accident survivors by Buckley, Blanchard, and Hickling (1998).

Another factor structure (arousal, avoidance, intrusion, and numbing) was reported by Sack, Seeley, and Clarke (1997) for a sample of 194 Khmer adolescent refuges. The symptom structure of PTSD in survivors of cancer was examined by Cardova, Studts, Hann, Jacobsen, and Andrykowski (2000). Their results provided partial support for the DSM model (reexperiencing, numbing/avoidance, and arousal). However, they warned that avoidance and numbing should be separate factors.

Anthony, Lonigan, and Hecht (1999) utilized confirmatory factor analysis to examine eight alternate models of PTSD symptom structures that were reported by previous researchers. These models were 1) general posttraumatic stress, which claims one single factor; 2) intrusion/avoidance and arousal/numbing; 3) intrusion/arousal and avoidance/numbing; 4) intrusion/arousal, avoidance, and numbing; 5) intrusion, arousal/avoidance, and numbing; 6) intrusion, numbing/avoidance, and arousal (DSM model); 7) intrusion/avoidance, numbing, and arousal; and finally, 8) intrusion, arousal, numbing, and avoidance model. Their results are based on a sample of 5,664 child and adolescent victims of the Hurricane Hugo disaster and suggest another model: intrusion/active avoidance, numbing/passive avoidance, and arousal. This study confirmed that DSM's model is not the best model; in fact, it is inferior to other models as previous studies suggested.

In sum, none of the factor analytic studies summarized above replicated the PTSD symptom structure reported in DSM. The previous factor analytic studies revealed different underlying factors for different traumatic experiences.

These inconsistent results provoked more discussion about the characteristics of DSM's symptom structures. For example, McMillen, North, and Smith (2000) suggested that the DSM criteria might be too stringent; especially criterion C, and

avoidance and numbing experiences might not be seen at the same time. In their review article, Davidson and Foa (1991) reported that avoidance symptoms are not commonly reported after natural disasters. In addition to several methodological issues, they speculated that this result might be because "a strong sense of community cohesion reduces avoidance after large scale disasters" (p.353). Other researchers noted that these inconsistencies might be a result of serious life events, such as developmental arrests, personality styles, cultural premises, and networks of social support (Horowitz, Wilner, Kaltreider, Alveraz, 1980).

Furthermore, despite the fact that DSM is widely used nationally and internationally, the potential impact of culture on PTSD symptom structures is not reflected in DSM. As can be seen from the definition, posttraumatic stress disorder is different from other disorders defined in DSM in terms of the emphasis on external stress sources that lead to the manifestation of PTSD symptoms. Despite the fact that several researchers note that since trauma is an external stress, trauma and culture are closely related, only a few direct empirical studies have examined the fitness of DSM model to different cultures. Jenkins (1996) examined the application of DSM-III's PTSD categories on a sample of Salvadorian women refugees. The psychological reactions of these refugees were assessed by several questionnaires and anthropological interviews. This study concluded that Salvadorian women's reactions met with PTSD's criteria A, B, and D, but criterion C was not found to be applicable: i.e., feelings of detachment, estrangement, restricted affect, foreshortened future, and avoidance types of reactions were not reported by this sample. Additionally, this study pointed out that the somatic reactions of these women are not listed in DSM. Jenkins (1996) proposes two possible explanations for these results: "a) diagnostic

difficulties inherent in observing these particular features (e.g., numbing, avoiding trauma related thoughts), or b) restricted cultural validity of the full syndrome as currently conceived and as applied to this sample" (p.174).

The current literature reports no systematic cross-national comparisons of PTSD symptom structures. Green (1996) notes the lack of cross-national studies and indicates several difficulties to do so beyond the lack of attention to culture in psychological research. Among these difficulties, Green (1996) and Marsella et. al. (1996) listed several important methodological difficulties (e.g., target sample, use of questionnaires, the timing of assessment) as well as social and political difficulties.

In summary, PTSD symptoms are commonly reported by survivors of traumatic events and the PTSD diagnosis is commonly given by mental health professionals. PTSD was first described in DSM in the 1980's. It is important to note that this inclusion was seen as an important milestone in the field, mostly because the classification of PTSD has given voice to many traumatized victims in the social and political arenas. Yehuda and McFarlane (1995) stated that the inclusion of PTSD in DSM contributed to efforts to develop a model that might provide more sophisticated formulizations about the experiences of traumatized individuals. However, despite substantial agreement and the validation of 17 PTSD symptoms, several questions remain on how these symptoms cluster. Factor analytic studies summarized above failed to replicate the PTSD symptom structure reported in DSM. In other words, the previous factor analytic studies revealed different underlying factors for different traumatic experiences and populations.

Inconsistent results are reported mostly for the avoidance/numbing symptom clusters. It was widely discussed that criterion C (avoidance/numbing) might be too

stringent, and that avoidance and numbing might not be seen at the same time (e.g., McMillen, North, and Smith, 2000). The numbing response was found to be less common for particular types of traumatic events, such as natural disasters, where survivors are more likely to receive social support (e.g., Davidson and Foa, 1991). Previous research also discussed that the construct of avoidance needs further clarification. For example, Anthony, Lonigan, and Hecht (1999) make a distinction between active avoidance (e.g., avoiding trauma related thoughts by engaging in distractive activities and social interactions) and passive avoidance (withdrawal from any activities). Some factor analytic studies found that avoidance may be highly correlated to arousal whereas others found that avoidance is correlated with reexperiencing symptom clusters. Also, the literature that examines posttraumatic reactions suffers from several methodological issues and/or difficulties, such as differences in traumatizing events, traumatized populations, and the timing of the measurement. Additionally, several variables make deliberations difficult in terms of interpretations and implications of the results, such as serious current and previous life events, developmental details, personality styles, existence of social support, and cultural values and beliefs.

2.3.2 Risk Factors For Psychological Trauma Reaction

Exposure to a traumatic event has been identified as a primary predictor of traumatic reactions. However, due to variations in PTSD rates, exposure to a traumatic event is no longer seen as a sufficient explanation for the development of PTSD (Brewin, Andrews, Valentine, 2000). Not every person exposed to a traumatic event develops PTSD and/or other psychological disturbances. Why? What makes some people more vulnerable to PTSD? More recent research examines several

variables that may further explain the development of PTSD. These variables can be categorized into three groups: (1) Characteristics of The Traumatic Event; (2) Personal Predictors; and, (3) Personality type predictors. Each of these categories is discussed in detail in the following sections.

2.3.2.1 Characteristics of The Traumatic Event

As discussed above, the characteristics of the traumatic event has considerable impact on people's reactions to trauma. Human-made trauma causes more severe psychological impacts than natural disasters in the long term while natural disasters may cause more devastating immediate psychological impacts (Salzer & Bickman, 1999). Research indicates that the devastating impacts of natural disasters substantially decreases after as little as 18 months (Steinglass & Gerrity, 1990). Herman (1997) nicely states why this is the case:

> To study psychological trauma is to come face to face both with human vulnerability in the natural world and with the capacity for evil in human nature. To study psychological trauma means bearing witness to horrible events. When the events are natural disasters or "acts of God," those who bear witness sympathize readily with the victim. But when the traumatic events are human design, those who bear witness are caught in the conflict between victim and perpetrator. It is morally impossible to remain neutral in this conflict. The bystander is forced to take sides. It is very tempting to take the side of the perpetrator. All the perpetrator asks is that the bystanders do nothing. (p.7)

The magnitude of the traumatic event is thought to be highly related to the severity of the psychological impacts. However, loss of resources (Freedy, Saladin, Kilpatrick, Resnick, & Saunders, 1994) and loss of community cohesion and loved ones (Lifton & Olson, 1999) may be more meaningful predictors than the physical magnitude of the disaster.

2.3.2.2 Personal predictors

Personal predictors include variables such as gender, age, and education level. Lewin, Carr, and Webster (1997) found that the 1989 Newcastle (Australia) earthquake survivors with lower educational levels reported more traumatic reactions.

For the present study, age and gender and not education level are the main interests. It is important to address how gender and age play roles in psychological reactions to disasters.

Although no previous research focused specifically on examining the relationships between disaster and gender, previous research indicates that overall, traumatic events have more negative impacts on women (e.g., Yehuda & Davidson, 2000; Brewin, Andrews, & Valentine, 2000). Research findings relating disaster and gender are mostly peripheral in nature. These findings report a few similar gender differences for adult survivors of various disasters. One of the common gender differences is that women are more likely to manifest PTSD, anxiety, and depression as reactions to traumatic events (Gibbs, 1989; Manuel, Anderson, 1993), whereas men display higher levels of aggression and substance abuse (Gibbs, 1989).

Sattler, Freedy, Anderson, and Kaiser, (1997) suggest that individuals with greater role expectations, such as caregivers and parents, might be facing more adjustment difficulties after traumatic events. This might be one reason why women are more vulnerable to psychological problems, as women are often seen as the primary caregiver. Bromberger (1996) discusses that some traits that make one more vulnerable to psychological distress are considered to be more characteristic of women than men: these traits include low instrumentality, high expressivities, sensitivity to the needs and feelings of others, and high tendency to self-focus or

ruminate on psychological distress. Also, these findings are consistent with the fact that previous traumatic experiences such as abuse is a primary predictor of other psychological problems including PTSD, and that women are more likely to have been previously abused.

However, it is important to note that even though the common finding is that women are more likely to develop traumatic stress, research focusing on women's reactions to natural disasters is very limited. Furthermore, most of the knowledge about trauma and women comes from research on human made trauma such as domestic violence, sexual assaults, and war, and these research findings are sometimes inconsistent. Brewin, Andrews, and Valentine (2000) found in their meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults that considerable gender differences exist among civilian populations whereas no gender differences are found among combat veterans. Also, some research reports no gender differences at all. Additionally, Solomon, Smith, Robins, and Fischbach, (1987) report that many men are found to manifest depression and alcohol problems as a result of a natural disaster, whereas this natural disaster had no direct effect on women.

Age is another variable that has been reported as a risk factor. Some researchers claim that older people (e.g., Cohen & Ahearn, 1980) and children (Belter and Shannon, 1993) are more vulnerable to disaster impacts. DSM-IV indicates that young children might have symptoms similar to adults, but the manifestation of these symptoms might be different. For example, intrusive and recurrent recollections of the traumatic events can be observed in children's play and intense fear/horror, and helplessness might be manifested as disorganized or agitated behavior.

Belter and Shannon (1993) found that the direct and immediate psychological impact of a disaster is imminent in children and adolescents; however, these psychological impacts do not produce diagnosable psychopathology. In the long run, most symptoms might disappear depending on several other conditions, such as the severity of the traumatic event and level of exposure. Additionally, children and adolescents' subjective interpretation of the trauma is one of the key variables in terms of determining the impact of such events (Keppel-Benson & Ollendick, 1993).

The review of the disaster literature also indicates that traumatic stress reactions for children show developmental progression (Green, Korol, Grace, Vary, Leonard, Gleser, and Smitson-Cohen, 1991). Green at al. explain that younger children typically display a disorganized traumatic state. In this state, children cannot understand what is going on very well and their reactions are mostly influenced by adults. As children get older, they might show adult like PTSD symptoms and adult like understanding of the trauma.

Research findings on middle age and older populations reveal a more complex picture. Although some earlier research simply report that older age groups are more vulnerable to natural disasters, most research indicates that older people are more resilient than younger people. In order to examine the reasons for older adults' resiliency, a recent study by Knight, Gatz, Heller, and Bengtson (2000) tested maturation and inoculation perspectives on 166 Northridge earthquake survivors (ages 30 to 102). According to these authors the maturation hypothesis maintains that people develop better coping styles with age while increasing their psychological maturity. On the other hand, the inoculation hypothesis maintains that prior exposure helps people to develop resiliency and the older people are more likely to have

experienced prior traumatic events. The findings of this study indicate no support for the maturation hypothesis and only partial support for the inoculation hypothesis with regard to depression. The authors further explain that older adults manifest much lower levels of emotional distress than younger adults. They also report that the resilience of older adults is closely related to their pre-disaster functioning.

In an earlier and more comprehensive study, Thompson, Norris, and Hanacek (1993) compared and contrasted four different perspectives on the relations between age and psychological reactions to natural disasters: (1) inoculation perspective; (2) resource perspective; (3) exposure perspective; and, (4) burden perspective. The authors explain that the exposure perspective maintains that older people are more likely to develop more severe psychological responses to natural disasters because they are less likely to receive warnings prior to disasters, have a greater reluctance to evacuate, experience a greater interference with accustomed patterns of life, experience a greater sense of deprivation resulting from their losses, and have a greater likelihood of a disaster related injury and economical loss. Likewise, the resource perspective maintains that older individuals are more likely to suffer from the impacts of natural disasters because their coping capacity deteriorates with age. This means that when people get older, they experience more physical health, economic, and social problems than younger adults. The inoculation and burden perspectives, on the other hand, uphold that older people are less likely to experience psychological problems than younger and middle aged people. The inoculation perspective states that coping capacity increases with age because older people have experienced more traumatic events/stressful life situations and thus they have developed more resiliency and better coping capacities. Finally, the burden

perspective maintains that older people are less vulnerable to traumatic events because they have fewer responsibilities. Unlike the other three perspectives, this perspective introduces a curvilinear relationship between age and traumatic reactions. According to this perspective, middle-aged people are more likely to be the provider for their younger and older family members, such as for their children's education and/or their parents' well being. Thompson, Norris, and Hanacek (1993) assessed these four perspectives using 831 adult survivors 12, 18, and 24 months after Hurricane Hugo and reported that there is a curvilinear interaction between the exposure to a traumatic event and age, and that the burden perspective is the best perspective to explain the relationships between age and psychological consequences of the natural disaster.

2.3.3.3 Personality Type Predictors

According to the literature, rumination and emotional experiences may be closely related to traumatic reactions. While the characteristics of the traumatic events and the person's age and gender are considered to be predictive factors, rumination and emotional experiences are considered not only as predictive factors but also as maintaining psychological factors.

Rumination is defined as a personality characteristic that plays a crucial role in people's emotional support seeking after major life events (Nolen-Hoeksema & Davis, 1999). In the case of traumatic events, "People with a ruminative coping style think repetitively and passively about their own emotional reactions to a trauma, focusing on their symptoms of distress ("I feel so lousy"; "I just can't concentrate") and worrying about the meanings of their distress ("Will I ever get over this?"…)"

(Nolen-Hoeksema & Davis, 1999, p. 802). Nolen-Hoeksema and Davis also state that their definition of ruminative style differs from other trauma researchers as they define ruminations as "an individual-difference" rather than as "a process variable." The authors state that

> …(other) theorists have tended to operationalize ruminations as intrusive thoughts primarily about the trauma, whereas our conception of rumination also highlights thoughts about one's emotional reactions to the trauma or to more chronic stressors, which may sometimes be intrusive…for example, ruminators have many thoughts such as "I'm a wreck," "I cannot cope," and "What's wrong with me? (p.802).

Most of the existing research on rumination emphasizes its relation to depression and anxiety disorders rather than PTSD. What we know from the depression/anxiety studies is that a ruminative personality is one of the essential factors for maintaining and exacerbating a depressive mood, anxiety, and pessimistic thinking (Nolen-Hoeksema, 2000). Lyubomirsky & Nolen-Hoeksema (1993) explain that people with ruminative styles tend to experience increased or sustained and longer durations of negative affect, to focus on the negative sides of events, and to be more pessimistic about themselves and their future. Lyubomirsky & Nolen-Hoeksema (1993) also report that ruminators are less likely to show a willingness to engage in activities that may help them to reduce their depressive mood by believing that rumination is the way of understanding their depression. Moreover, it has been suggested that ruminators tend to experience more interpersonal problems (Lyubomirsky & Nolen-Hoeksema, 1995) and tend to have poorer problem solving skills due to negative self-criticism, self-blame for problems, and reduced self-confidence and perceived control (Lyubomirsky, Tucker, Caldwell, & Berg 1999).

In one of the few studies on trauma and rumination, Nolen-Hoeksema and Morrow (1991) examined the affects of rumination on PTSD after the 1989 Loma Prieta earthquake using 137 students and concluded that rumination is one of the predictors of traumatic stress and depression, even after controlling for pre-disaster depressive mood and PTSD symptoms. They explain that students with ruminative response styles are less likely to initiate certain activities that distract themselves from negative moods but purposely focus on their negative mood and its implications. Moreover the authors discuss that ruminators are less likely to disclose to others their traumatic experiences and thus they are more prone to long-term negative reactions to trauma. However, interestingly they found that students who talked about the earthquake neither gained benefit nor were hurt by it. This is a significant finding because sharing traumatic experiences has been seen as the opposite of ruminating on the traumatic experience. Based on this finding, Nolen-Hoeksema and Morrow (1991) speculated that in the case of natural disasters people are more likely to feel comfortable talking about the traumatic event, as all earthquake survivors talked about it for the first 10 days following the earthquake. Therefore, sharing was not found to be one of the predictors.

This speculation is reminiscent of Pennebaker and Harber's (1993) "a social stages" model that they created based on the disclosure behaviors of Loma Prieta Earthquake survivors and Dallas residents during and after the Persian Gulf War. In this study, Pennebaker and Harber measured how much people talk and think about these two incidents over time and concluded that 2 to 3 weeks after the events people talk and think about them openly. They called this first time period "the emergency stage." After this stage, the authors observed a sharp decrease in people's talking

behavior. In this stage that was called “the inhibition stage”, people almost stop talking about the events but continued thinking about it with slightly decreasing frequency for approximately six weeks. In the last stage called “the adaptation stage”, people were observed to be neither talking nor thinking about the events. Even though Pennebaker and Harber (1993) state that it is not clear why people stopped talking but continued to think about the earthquake and the Gulf War during the inhibition stage, they do note that this is the stage that people experienced negative moods, arguments, dreams, and display other adverse reactions that are typical marks of posttraumatic reactions.

Why do people not share their emotions and/or thoughts about the traumatic events that create emotional upheaval? One possible explanation is people’s concern for social disapproval. Wegner and Lane (1995) claim that people keep secrets because they are afraid of “ostracism, retaliation, derision, maniacal laughter, armed intervention” (p.26). When trauma survivors tell their stories, they expect affirmation for their understanding of trauma and that what they did as a reaction to the trauma was appropriate (Nolen-Hoeksema & Davis, 1999). However, society does not always provide a supportive environment for trauma survivors and such environments make disclosure even more difficult. Herman (1997) argues that listening to trauma creates discomfort for listeners as they may be overwhelmed with the nature of the traumatic event and thus they may experience difficulties staying calm and clearheaded.

In fact, the existing experimental research findings show that sharing plays just as an important role as the social/cultural atmosphere in reducing both psychological distress (e.g., Nolen-Hoeksema & Davis, 1999) and somatic complaints

(e.g., Pennebaker, 1995). Major traumatic events have intense and long lasting impacts on emotions (Pennebaker, 1995). People may deal with these intense emotions by expressing them, which may be facilitated during the course of conversation and writing letters/diaries (Rime, 1985).

However, Kennedy-Moore and Watson's (2001) review of research on emotional expression unfolds "the paradox of distress expression." They explained that expression of negative emotions can be perceived as a sign of distress as well as a sign of coping with the distress. In this study, two distinct types of expression-related personality traits are introduced. The first type of personality trait involves a high threshold for stress and a strong tendency to inhibit emotional reactions. People with this trait are less likely to be expressive simply because they do not have the tendency to react strongly to distressing situation and/or they can easily inhibit their reactions. People with the second type of personality trait have a low threshold for stress and are more open to talking about their feelings and thus they are more likely to show strong expressiveness about emotional stimuli. The authors establish that people of both expression-related personality traits are prone to psychological difficulties. People who tend to restrain their emotions are more likely to experience poorer psychological and physical well-being as discussed above. Expressive people tend to hold pessimistic outlooks and are more likely to be overly sensitive to stressful situations. These people are also more likely to experience interpersonal difficulties because listeners may become overwhelmed with their emotional disclosure. The conclusions of this study, however, do emphasize the importance of disclosure as a way of reducing distress, gaining better insight, and developing better interpersonal relationships under specific circumstances. The authors suggest that expressiveness

can be the most helpful "in the context of a supportive relationship, if it involves an intermediate level of intensity, and when it is accompanied by expressions of positive emotions" (p.16) within the comfort level and willingness of people who are expressing and listening.

Therefore, as a result of personality features and/or social circumstances where emotional inexpressiveness is encouraged, people in stressful situations "naturally" utilize emotional regulations to minimize the intensity of their negative emotions (e.g., Petrie, Booth, & Pennebaker, 1998). Gross (1998) describes emotion regulation as

> the process by which individuals influence which emotions they have, when they have them, and how they experience and express these emotions. Emotion regulatory process may be automatic or controlled, conscious or unconscious, and may have their effects at one or more points in the emotion generative process. (p.274)

Emotional experience is the key element for the formulation of PTSD. The main struggle for trauma survivors is that while they try to numb themselves or try to avoid any trauma related thoughts that otherwise elicit intense negative emotions, they also suffer from intrusive trauma related thoughts.

Newly emerging literature brings explanations for individual differences in emotion regulation in the case of trauma. This literature relies on the extensive emotion literature that examines individuals' emotional experiences and their subjective perceptions of these emotions. Mayer, Salovey, Gomberg-Kaufman, and Blainey (1991) discuss that "the experience of mood is broader than its emotional content alone" (p.100). The experience of mood also involves the process in which thoughts, beliefs, and values about emotional experiences effect emotion regulation processes. In their study, a new model, the "multi domain approach" and a new

measure that integrates both "emotion-related" and "emotion-management-related" experiences are introduced. According to these authors, this model reflects that meta-mood experiences of mood, emotion-related mood experiences (including physical, emotional, and cognitive aspects of emotions) and emotion-management-related mood experiences (thoughts of action, suppression, and denial aspects of emotion management) take place simultaneously.

Solovay, Mayer, Goldman, Turvey, and Palfai (1997) emphasize that individuals differ in terms of their meta-mood skills and their way of processing meta-mood experiences because coping with stressful experience relies on a capacity to "discriminate, attend, and regulate" feelings. More specifically, even though cognition and emotion are independently functioning components, they work as interdependent response structures in a stressful situation.

Therefore, individuals regulate and attend to their emotional responses to trauma based on their thoughts/beliefs about emotions. Solovay et al. (1997) conducted an experimental study with 78 students who watched a video clip consisting of images of drunk driving, traffic accidents, emergency rooms, and victims' descriptions of their accident. The students filled out several questionnaires before and after the video clip. These researchers examined relationships among negative and positive thoughts, rumination, and meta-mood traits (clarity in discrimination of feelings, attention to feelings, and mood repair). They found evidence that meta-mood traits, especially clarity in discrimination of feeling, mitigates against the negative impacts of stressful situations. Clarity and repair were found to be closely related to reduced rumination and negative and intrusive thoughts, whereas attention to feeling was found to have less affect on these variables. They

explained that this might be due to their instructions to students to pay close attention to their thoughts and emotions during the experiment.

In summary, traumatic reactions may be closely related to characteristics of traumatic events as well as characteristics of the survivors, such as level of exposure, type of loss, age, gender, educational level, rumination, and emotional experiences. These variables are the interest of this study because their impact on traumatic reactions to natural disasters either has not been studied or if they have, the results are inconsistent. Moreover, these variables were previously examined independently using different types of samples, such as all women or all men, who were exposed to different types of traumatic events, such as sexual assault, war, or a traffic accident. In some cases, research participants were not trauma survivors at all, rather participants' reactions were assessed in an artificially created stressful situation. Furthermore, these variables have not been examined in the context of the population's culture. These predictors as well as general human reactions to traumatic event were examined in western cultures; or more specifically, in North American culture. This study aims to bring these independently examined variables together and examine their associations with PTSD in a different cultural context. In the next section, some of the cognitive and emotional processing theories regarding the development of PTSD are integrated. These theories were selected because they specifically discuss the relations among PTSD symptoms with regard to cognitive and emotional factors that contribute to the development of PTSD.

2.3.3 Cognitive Theories on The Development of PTSD

Cognitive processing models assume that individuals enter into novel situations with preexisting mental schemata or memory networks. These schemata

contain detailed information of the individual's past experiences as well as assumptions and expectations regarding future events, the world, and the self. New information is evaluated, interpreted and assimilated based on these preexisting schemata. These evaluation, interpretation, and finally integration processes may take a long time and may create stress if the new information is inconsistent with the preexisting schema. The more inconsistent the new information and the preexisting schema, the larger the resulting stress. In traumatic events, the new information is often too contradictory and confrontational, and thus too threatening. In some cases, individuals either alter their preexisting schemata according to the new information or attempt to change the new information in order to integrate the threat-related information into their preexisting schemata. These attempts require psychological confrontations that create severe distress. Therefore, trauma survivors have a strong desire to avoid or escape from trauma reminders such as thoughts and external clues. Until this information is assimilated and integrated into existing views of the world, it is stored in the active memory and will continue to produce intrusive and emotionally upsetting recollections. In other words, attempts to assimilate this threatening information requires revisits to those very same aversive stimuli that one tries to avoid, suppress and/or numb himself/herself to cope with the stress created by the trauma related recollections.

Wegner and Lane (1995) introduce a model that explains the development of psychological disorders as a result of suppression, which in effect is creating a mental control strategy to overcome trauma-induced stress. According to this model, thought suppression goes hand in hand with intrusive thoughts in a cyclical repetitive manner. Wegner and Lane (1995) explain two cognitive processes, the operator and the

monitor processors, which are responsible for intrusive thoughts as a result of thought suppression. The operator is a process of shifting attention to anything other than the unwanted thought. During this process the monitor process is activated in which unwanted thoughts are automatically sought and once the unwanted thoughts are discovered, the operator process is activated in order to suppress the unwanted thought. It is further explained that even though the operator process is dominant most of the time, under the conditions of cognitive load, the monitor process gains more control. "When the automatic processing becomes the default response, as is the case under high load, the unwanted thought is highlighted and projects into consciousness without a stop guard" (p.32). This means that the unwanted thought becomes hyper accessible as the effort of suppression is increased. This cycle, called the rebound effect (Wegner, 1989), occurs until the unwanted thought is expressed.

Similar to Wagner and Lane's (1995) approach, Horowitz (1986) explains that trauma creates two opposing sets of internal processes, intrusion and denial, that people use to cope with and resolve responses to extreme stressors. The intrusions are painful and able to trigger an opponent process of ideational and emotional denial that represents the defensive phase of adjustment. The function of emotional numbing is to ward off painful memories by minimizing the feelings associated with traumatic memories (Litz, Orsillo, Kaloupek, & Weathers, 2000). Thus, in this process, individuals with traumatic experiences shift back and forth between generalized unresponsiveness and intrusion until resolution of the trauma occurs.

It has been widely discussed that emotion plays an important role in the development of psychological problems. In more general terms, Mahoney (1997) introduces six categories of emotional difficulties that contribute to the development

of psychological problems: “a) the pain of acute or chronic negative affect, b) emotional numbing, c) fear of feeling, d) perplexing emotional reactions, e) emotional conflict or ambivalence, and f) experiences (usually painful) associated with unfinished or inadequately expressed affects” (p.243).

Emotions play an important role in the cognitive processes of traumatic experiences. The personal meaning of the traumatic experience attaches an emotional significance to this cycle and thus thoughts linked with negative emotion are more likely to be intrusive and increase the likelihood of rebounding effects (Rachman, 1982). Roemer and Borkovec (1994) found evidence for Rachman’s (1982) claim in their experimental study with a sample of non-clinical college students and described a cycle in which

> (1) the suppression of a thought leads that thought to become associated with negative emotion (or arousal); (2) a thought associated with negative emotion is more likely to be intrusive; and, (3) an intrusive thought is likely to lead to further attempts to suppress that thought. This cycle can be reversed when repeated exposure to (expression of) the thought leads to habituation of the emotional response. A thought no longer associated with negative emotion becomes less intrusive, eliminating any need for suppression. (p.7)

In terms of PTSD, clusters of avoidance/numbing and re-experiencing might reflect this ambivalent relationship between avoidance and intrusive thoughts. Individuals with PTSD are examined both for their intense negative emotional reactions, especially when they are reminded of traumatic incidences, and avoidance/numbing emotions as reactions to the traumatic incidences. This means that individuals who suffer from PTSD report two different types of problems related to their emotions: intense negative emotional reactions, and disinterest in circumstances that would otherwise elicit emotion and a lack of ability to experience and express emotions (Litz, Orsillo, Kaloupek, & Weathers, 2000).

Foa and Kozak (1986) contribute to these approaches by adding the role of psychological arousal. Psychological arousal is one of the criterions described in DSM-IV and it has substantial effects on cognitive processes due to its effects on understanding and interpretations of experiences. These authors elaborate on an approach to the development of PTSD based on the fear network theory. According to their approach, traumatic experiences cause the development of fear networks in memory. This network includes information about cognitive, behavioral, and physiological reactions to the initial trauma experiences. Any reminders of traumatic experiences can activate the fear network. Activation of the fear network brings suppressed thoughts/emotions into the consciousness along with physiological arousal. The unpredictable and uncontrollability nature of trauma makes integration and assimilation of the traumatic experiences into the preexisting memory network difficult.

Several suggestions have been made on ways to break the cycle of intrusive thoughts and the efforts to suppress those intrusive thought. The inhibition-confrontation approach explains that disclosure after the traumatic experiences is essential to break the cycle because inhibition not only consumes a substantial amount of mental energy but also restrains physiological functioning (Pennebaker & Beall, 1986). Therefore, active exploration and disclosure of the trauma should result in better psychological and physiological functioning by causing cognitive reappraisal of traumatic schemata which in turn reduces the intensity of intrusive thoughts and ruminations (Greenberg, Wortman, & Stone,1996).

Similarly, the habituation approach also points out the function of expressiveness. This approach (Roemer & Borkovec, 1994) states that disclosure of

thoughts and emotions relating to the traumatic event helps to prevent intrusive thoughts and ruminations because individuals become accustomed to unwanted thoughts through repeated exposure. The basic premises of the habituation approach is that habituation results in cognitive restructuring of the schemata related to the traumatic experiences due to repeated exposure to traumatic recollections. Therefore, disclosure of the traumatic event is necessary to revise the negative affects of the traumatic experience so that intrusive thoughts are prevented, emotional responses to those thoughts are reduced, the intensity of physiological arousal is reduced and, consequently, it is easier to integrate the information from the traumatic experiences.

As discussed above, people's thoughts about their emotions also contribute to the development of PTSD. Most empirical studies about meta-mood experiences have been done with non-clinical samples. In one of the few studies examining the relationship between meta-mood experiences and psychological problems, Ansorge, Litz, and Orsillo (1996) discuss the impact of thought and beliefs about emotion on the development of PTSD. The authors discuss that attitudes and beliefs about emotions may develop prior to or after the traumatic experiences. When people encounter traumatic experiences with well-developed beliefs about emotions and emotion regulation styles, they understand, interpret, and react to the traumatic experiences according to these beliefs, which may hinder or facilitate their coping. Ansorge et.al. (1996) conducted a study to test this relationship with Vietnam veterans with and without a PTSD diagnosis and reported significant relationships between war-induced PTSD and meta-mood experiences. More specifically, they found that dysfunctional attitudes (low affect tolerance and seeing emotions as worthless, incomprehensible, and uncontrollable) exacerbate the severity of PTSD.

In summary, it seems plausible that traumatic events may cause people to be stuck in their past as they try to assimilate the new experience into their schemata. The incongruent nature of the traumatic experience with their present schemata results in severe stress. In order to cope with this stress, people try to avoid and/or suppress any thoughts and feelings that remind them of the traumatic event. However, the effort of avoidance/suppression can cause intrusive thoughts as a result of rebounding effects. Thus, survivors are unable to move on with their life because they continue to go back and forth between suppression of the clues of trauma and rumination about the trauma until either the new information or their schemata is changed. The process of thought suppression is more difficult when there is an emotion attached to the thought. Cognitive processing is facilitated or hindered by several factors such as meta-mood and the cultural or social environment in which people live. For example, meta-mood experiences may interfere with the cognitive process because (Wegner & Pennerbaker, 1993)

> The failure to suppress an unwanted thought can lead to feelings of failure or to meta-cognitions in which the individual concludes that she or he is unable to control unwanted thoughts. We propose that these meta-cognitions in turn may lead to even more frantic attempts at suppression, which also fail until the recurring unwanted thought rebounds into a full-blown obsession.(p.123).

2.4 Impacts of Culture on Psychological Well-Being and The Development of PTSD

One of the aims of this study is to bring different cultural perspectives to the field. Addressing this issue is important for the sake of practitioners and theoreticians of psychology. Psychological science has been claimed to be a by-product of western tradition and fashioned by particular cultural and historical conditions (Ardila, 1982; Kagitcibasi, 1996; Pawlik, & d'Ydeealle, 1996). Moreover, psychology has often

been criticized as being an oppressive institution, primarily in its unreflective perpetuation of the status quo and portrayal of Euro-American norms as universal (Sue & Sue, 1990). It is not surprising but rather natural that most western researchers assume an individual's aspiration are closely related to what is valued in their own society and thus, western forms of thinking, social organization, and personality development have been accepted to be inherently superior (So, 1991). This is an extremely important discussion because as Castillo (1997) suggested, since mainstream psychology is based on western values and forms of thinking, members of other cultures are in danger of being pathologized when they do not conform to these western forms of thinking.

Therefore, there are serious doubts about the concepts and theoretical notions that define and describe traumatic stress and other psychological problems as to whether or not the western models of understanding human reactions to extreme traumatic events are adequate to apply to other societies and cultures. In this section, a number of the main theoretical and empirical studies are summarized. These studies were chosen because they clearly discuss how indigenous cultures might have different points of view on their understanding of mental health than that by mainstream psychology professionals. This summary is followed by discussions on the impact of culture on the development of PTSD, which is the main focus of the present study.

2.4.1 Culture and Understanding of Mental Health

People understand and interpret their psychological functioning and/or dysfunctioning based on their cultural upbringings. For example, Wig (1990)

discusses Indian concepts of mental health and their impact on the care of mentally ill. His article describes some of the concepts relevant to understanding mental health and disease as they are presented in the traditional medical literature of India. Wig follows this with a discussion of certain Indian concepts as presented in texts related to the three different religions that originated in India: Hinduism, Jainism and Buddhism. Subsequently, the author briefly describes the present-day mental health services in India. One of his main points is that, unlike in the western intellectual tradition, there is no true mind-body differentiation in the Indian philosophies. Even the concept of "mind" does not exist in the various Indian languages and philosophies. Wig cites three aspects of the definition of mental health in India from the work of an Indian academic, Dr. Surya: a mentally healthy person is a) comfortable within himself (and thus has no mental illness or infirmity) b) makes others around him comfortable (and thus is socially well-adjusted), and c) strives continually to evolve to higher spiritual levels. It is emphasized that this definition, like all other mental health definitions, reveals the imprint of the cultural value system of the person who created the definition. This article therefore provides a good example for how the definitions of mental health and indigenous belief systems are connected to each other. The western understanding of mental health, in which the main focus is individualism and mind/body dualism, is clearly quite different than the understanding by Indian lay people.

Another example of how indigenous culture might affect mental health comes from Ng (1993). Ng offers a good illustration of the benefits and means to utilize some cultural factors in psychiatric rehabilitation using authentic characteristics of Hong Kong's culture in which, unlike western cultures, the family and/or society is

given priority over individuals. He discusses the interrelationship between the effects of the physical and social environments and Chinese culture on Chinese psychiatric patients. His community approach claims that strong family and social ties should be utilized in order to provide secure care and emotional and material support to chronically mentally ill patients. The author also outlines some benefits regarding the practical effects of this approach, particularly in terms of improving the patients' quality of life and in reducing the cost of treatment. Disadvantages are also discussed. For example, the author states that the strong family and social bonding might create denial or tolerance of the family member's important symptoms in order to protect the family name and to maintain family stability.

Luk and Bond (1992) examine the perceived importance of the causes and cures of psychological and behavioral problems as evaluated by Hong-Kong Chinese. Luk and Bond examine the areas of agoraphobia, anorexia nervosa, compulsive gambling, schizophrenia, child abuse, social apathy, lack of civic responsibility, neurasthenia, and two mental illnesses which are specific to Hong Kong Chinese: using the "back door" (corruption), and shen-kwei, which is a culture-specific psychosexual problem. This study relies on the idea that psychiatric disorders differ in different cultures in terms of epidemiological symptomatology, illness behavior (courses and outcome), illness beliefs, and even psychophysiological experiences (Kleinman, 1988).

This study looked more specifically at what dimensions Hong Kong lay people use to perceive causes and cures, and how these dimensions are used to perceive causes and cures for different, specific problems. There were two groups of participants in the study. With the help of the first group (5 males and 5 females), a

questionnaire to measure lay beliefs of Chinese on the causes and cures of psychological problems was constructed. This questionnaire was administered to the second group of participants (111 male, 111 female). They found two factors (environmental/hereditary and social/personal) as the causes and three factors (commitment, clinical methods, and protection) as the cures. The authors end by discussing their findings with respect to Chinese and western cultures. They suggest that Hong Kong Chinese hold an interactionistic model for causality, but make internal attributions for cures. This study is important because it extends our understanding of the perception of lay people concerning causes and cures of psychological problems cross-culturally. However, there was no discussion of the implications of their findings in terms of the application of psychological theories. It might have been useful if they had included some discussion about what is happening in Hong Kong in the field of psychology and how their findings are linked to their situation.

2.4.2 Cultural Impacts on The Development of Psychological Trauma

> …the development of characteristic symptoms following exposure to an extreme traumatic stressor involving direct personal experience of an event that involves actual or threatened death or serious injury, or other threat to one's physical integrity; or witnessing an event that involves death, injury, or a threat to the physical integrity of another person; or learning about an unexpected or violent death, serious harm, or threat of death or injury experienced by a family member or other close associate. (DSM-IV; p.424)

As is explicit from this definition of PTSD, trauma is an external stress which puts PTSD in a special position. Therefore, it is safe to claim that trauma and culture are closely related because trauma is an external stress (Kleber, Figley, & Gersons, 1995). This is especially true for natural disasters, which affect whole families and

communities and is lived in a social environment. The psychological atmosphere in a society is a crucial factor that determines people's interpretations and it clearly facilitates or hinders the process of coping with stressful life events (Kleber, Figley, & Gersons, 1995). In his analysis of a devastating flood (the Buffalo Creek disaster), Erikson (1976) spoke of two traumas: the first trauma was the occurrence of the traumatic event itself and the second trauma was the destruction of community life and the loss of social contacts. He emphasized the relevance of the socio-cultural nature of the area and its population in understanding the long-term effects. He reminds the readers that the survivors of this disaster remained in the area, where they were confronted by memories of the disaster every day. Many continued to be employed at the same mining company that had built the dam that collapsed and caused the flood. The inhabitants were placed in emergency accommodations without consideration of the existing relationships between neighbors and relatives, so that the community ties, which were essential to them, were severely disturbed.

As discussed above, the basic premise of cognitive models on the development of PTSD is that trauma survivors encounter new experiences involving information that is too incongruent with their preexisting schemata. As trauma survivors try to assimilate the new information into their schemata, they encounter intense distress. Creamer (1995) discussed that these integration and assimilation processes can be facilitated or hindered by the culture in which the traumatized person interacts via rituals, customs and so on. A potentially traumatic event's interpretation may be influenced largely by cultural expectations and social norms; what is traumatic in one culture or one society may not be so in another.

During the recovery phase, rituals, attitudes, and expectations may facilitate or impair the survivor's ability to come to terms with the experience. In summary, the social and cultural context with its belief systems, along with traditional family and social role expectations have a substantial impact on an individuals' understanding of and coping with traumatic events. In this sense, concentrating on more interpersonal, social, and existential factors can make a valuable contribution to the current formalization of posttraumatic reactions; however, almost no empirical cross-cultural literature exists on disaster research (Green, 1996) despite the fact that the cultural backgrounds of most of the leading names in the field varies widely (Boehnlein, 1997).

It is known that culture mediates the experience and expression of emotion. It is suspected that members of individualistic cultures might manifest more avoidance/numbing symptoms whereas the members of collectivistic cultures might manifest more reexperiencing symptoms. However, there is no known cross-cultural research on which to base these predictions of how people of different culture regulate (express or suppress) their emotions in the case of PTSD, despite the fact that emotional suppression and intrusive thoughts are the main determinants of a PTSD diagnosis and DSM-IV is the prime diagnostic tool nationally and internationally.

Although, no systematic cross-cultural study was found, the existing literature contains some discussion regarding the universality of traumatic reactions to trauma based on independent studies done in different countries. Among them, Green's review of international disaster studies (1996) focuses on natural disasters and concludes that regardless of an individual's cultural background, some experiences can be traumatic, and PTSD and its symptoms are manifested universally; however,

the meanings of these experiences may differ from one culture to another and the full PTSD diagnostic criteria are infrequently met in international disaster studies. Similarly, Marsella, Friedman, Gerrity, and Scurfield (1996) report that PTSD is a common diagnosis among people of non-western countries such as Asian refuges, Latin American disaster survivors and immigrants. However, they also point out that due to cultural variations in emotional experiences, PTSD can be also seen as a culture-bound syndrome. Somatization, intrusive thoughts, dissociative experiences, avoidance/numbing and arousal symptoms, and the meaning attributed to these symptoms may vary as a function of an individual's cultural background. Below are some sample of the international disaster studies and their findings.

- de la Fuente (1990) examined the psychological reactions of Mexican earthquake survivors and reported that 32% of the survivors manifested PTSD, 19% had generalized anxiety, and 13% had depression.
- Lima, Pai, Santacruz, and Lozana (1991) reported that the majority of 102 volcanic eruption and mudslide survivors were diagnosed with PTSD and depression.
- Taylor (2000) examined 298 Tuvalu people after a fire in a dormitory at a secondary school and reported that "overall the Tuvalu people displayed a typical range of traumatic reaction to the tragedy." 31% displayed intrusive, avoidance and arousal symptoms and met the PTSD criteria.

- Odaira, Iwadate, and Raphael (1993) assessed 7,129 earthquake victims and found body swaying, trembling, anxiety, fear, irritability, and depression to be the most common reactions.
- -McFarlane and Hua (1993) examined 1,258 earthquake victims. Anxiety, depression and PTSD symptoms were found to be the most common symptoms. 50% of the cases met the PTSD diagnostic criteria.

Therefore, findings from investigations of the symptom structures in different trauma populations have been inconsistent and have not been concordant with the symptom clusters specified in DSM-IV as discussed earlier. Questions mostly concern methodological issues and/or difficulties, such as differences in traumatizing events and traumatized populations, and the timing of the measurement. Also, the culture and/or social environment make a significant impact on people's reactions to trauma. Above all, natural disasters affect whole families and community along with individuals. The psychological atmosphere in a society is a crucial factor that determines people's interpretations and it clearly facilitates or hinders the manifestations of symptoms and the process of coping with stressful life events (Kleber, Figley, & Gersons, 1995). Finally, whether DSM's definition and criterions reflect the cultural upbringings is imprecise so far.

2.5 SUMMARY

Two main goals are formulized based on the current literature summarized above.

The first goal of the study is to examine the diagnostic features of PTSD with consideration of several factors that contribute to the development of PTSD, such as the survivor's gender, age, severity of loss, and personal and personality type characteristics. In other words, the present study aims to contribute to the debate about identifying the factor structures of posttraumatic stress disorder clusters in a sample of survivors from the 1999 Turkey earthquake, as well as to provide discussion in terms of the fitness of PTSD clusters to another culture, with the Turkish culture being the example. This is the interest of the present study because very little is known about the cultural appearances of trauma despite the fact that the impact of cultural values, belief systems, and rituals are so important not only in what kind of symptoms might be manifested, but also in how these symptoms are manifested after natural disasters.

The second goal of the study is to examine some cognitive and emotional experiences that are central features of the development of PTSD: rumination, emotion regulation, and meta-mood experiences. These variables and their cultural appearances are crucial because they explain not only the onset of posttraumatic reactions but also they are maintaining factors as they were derived from theoretical considerations.

CHAPTER III

Methodology

3.1 Goals of The Present Study

The main goal of the present study is to examine the traumatic reactions of Turkish earthquake survivors in a culture specific context. This main goal has two major parts: a) examination of the diagnostic features of PTSD in order to test the fit of DSM-IV-specified symptom clusters to Turkish earthquake survivors and b) examination of the strength of associations between level of exposure, rumination, age, gender, type of emotion regulation, and meta-mood traits, and PTSD.

3.2 Examination of The Diagnostic Features of DSM-IV PTSD Model

In this part, the symptom structures of PTSD were examined to test the fit of DSM-IV's model to a Turkish sample. This was one of the main interests of the study for two reasons. First, the previous research reported inconsistent results about the fit of DSM-IV's PTSD symptom clusters to different populations exposed to different traumatic events. Second, even though DSM-IV is widely used nationally and internationally, its fitness to different cultures has been examined. In order to examine the symptom structures of PTSD for a Turkish population, confirmatory and exploratory factor analysis were conducted using 440 earthquake survivors' responses to The Reaction Index Scale (RIS). The RIS was developed to measure posttraumatic stress reactions. Thus, the research question for this part was:

Do Turkish earthquake survivors manifest a different pattern of PTSD symptom structures than is predicted by DSM-IV?

3.3 EXAMINATION OF THE RELATIONSHIP BETWEEN RISK/RESILIENCE VARIABLES AND THE DEVELOPMENT OF PTSD

The second major goal was to examine cognitive (ruminations) and emotional experiences that were thought to maintain PTSD along with risk factors such as age, gender, and the magnitude of distress due to the traumatic event. Hence, the variables examined were the **level of exposure** to the earthquake**, personal variables** such as age and gender, and **personality variables** such as rumination, emotion regulation, and meta-mood traits. The associations of these variables with PTSD were examined individually using hierarchical multiple regression models. More specifically, this study examined the following hypotheses:

Hypothesis 1: Personal Factors

As discussed in the literature review section, age and gender were reported in prior investigations to be related to PTSD and other psychological reactions to trauma. Therefore, it is hypothesized that age and gender will be associated with PTSD. More specifically,

1a) Age will be negatively related to levels of PTSD even after controlling for the effects of economic and education levels, and number of children.

1b) Women are more likely to report higher levels of PTSD even after controlling for the effects of economic and education levels and number of children.

Hypothesis 2: Level of Exposure

Exposure to a traumatic event is one of the diagnostic criteria for PTSD and it has been widely reported by previous studies that personal and material losses are closely related to PTSD. Therefore, it is hypothesized that the level of exposure to the

earthquake will be related to PTSD even after controlling for the effects of economic and education level, gender, and number of children.

More specifically, levels of exposure as measured by The Distress From The Earthquake Scale will be positively related to levels of PTSD as measured by The Reaction Index Scale.

Hypothesis 3: Personality Type Factors

It is hypothesized that some cognitive and emotional characteristics of earthquake survivors will be associated with PTSD even after controlling for the effects of economic and education levels, gender and number of children. More specifically,

3a) Rumination: The relationship between rumination and depression and other anxiety disorders has been established and ruminators are found to be more prone to psychological disturbances due to poor problem solving skills, a pessimistic outlook and poor interpersonal relationships. Rumination is also discussed to be an important aspect of intrusive thoughts by previous studies. Therefore, it is hypothesized that levels of rumination as measured by The Rumination Scale will be positively related to levels of PTSD as measured by The Reaction Index Scale even after controlling for the effects of education and economic level, gender, and number of children.

3b) Emotion Regulation: The paradoxical aspects of expressiveness have been shown by previous studies. People who express their emotions in a specific context with an appropriate level of intensity are more likely to cope

better with stressful experiences. The existing literature reports more than one type of emotion regulation. Suppression as an emotion regulation style was reported to be closely related to psychological disturbances because it exacerbates intrusive thoughts as it increases the likelihood of rebounding effects. Conversely, reappraisal was described as a more adaptive way of emotion regulation because in this case people evaluate their emotions in a specific context before his/her emotions spill over. Therefore, types of emotion regulation (suppression and reappraisal) as measured by The Emotion Regulation Questionnaire will be related to PTSD as measured by The Reaction Index Scale. More specifically,

> **3b1. Suppression:** It is proposed that suppression will be associated with PTSD even after controlling for the effects of education and economic level, gender, and number of children.

> **3b2. Reappraisal:** It is hypothesized that appraisal will be negatively associated with PTSD even after controlling for the effects of education and economic level, gender, and number of children.

3c) Meta-Mood Traits: Meta-mood traits (clarity in discriminating feelings, attention to emotional experiences, and mood repairs) are important factors to decrease the intensity of negative emotions and rumination, and mitigate against the negative impacts of stressful situations. Therefore, for this study, it is hypothesized that meta-mood traits as measured by The Trait Meta-Mood

Scale will be negatively associated with PTSD as measured by The Reaction Index Scale even after controlling for the effects of education and economic level, gender, and number of children. More specifically,

3c1. Clarity in discriminating feelings: Clarity on emotional experiences will be negatively related to levels of PTSD even after controlling for the effects of education and economic level, gender, and number of children.

3c2. Attention to emotional experiences: Attention to emotional experiences will be negatively related to levels of PTSD even after controlling for the effects of education and economic level, gender, and number of children.

3c3. Mood repair: Mood repair efforts will be negatively related to levels of PTSD even after controlling for the effects of education and economic level, gender, and number of children.

3.4 EVENT

Istanbul Earthquake (1999): A devastating event occurred in Turkey on August 17, 1999, when an earthquake registering 7.4 on the Richter scale hit the northwest part of Turkey, centering on Istanbul, Golcuk, Izmit, Adapazari, Yalova, and Kocaeli. This area is the industrial heart of Turkey and historically the most attractive area for domestic immigrants, and is therefore the most populated area. The

worst part of this devastating earthquake was that it hit at 3:01 a.m. when the victims were at home sleeping. As apartment buildings collapsed, people were buried alive. On November 13, another earthquake hit the same area, registering 5.8 in magnitude. This earthquake caused already damaged buildings to collapse and injure people. This time, many of the deaths were due to heart attacks, and many people jumped in panic from their windows and balconies. Official estimates of the death toll are in excess of 17,000, while 1.5 million people were made homeless. The earthquake was classified as one of the world's six deadliest earthquakes of the century (Newsweek, 1999) and the biggest disaster in the history of the Turkish Republic.

3.5 PROCEDURE AND PARTICIPANTS

3.5.1 Participants and Procedures for Sample 1

Shortly after the earthquake in Turkey, many international rescue teams came to Turkey from all over the world. One of the groups from the U.S.A arrived six weeks after the earthquake to implement their outreach program under the leadership of Dr. Kalayjian. The program was called the Mental Health Outreach Program (MHOP) and was developed based on Alfaro's work (1986). This group stayed in the area for two weeks and delivered the six-step intervention program with the cooperation of other psychologists from Turkey, Israel and Germany. This empowerment program reached over 600 people between the ages of 5 and 60. The steps of the program were 1) Assessment, 2) Expression of Feelings, 3) Empathy and Validation, 4) Discovery and Expression of Positive Meanings, 4) Information Dissemination, and 6) Diaphragmatic Breathing Exercises.

For the first step of the program, the level of post-traumatic stress was measured using the Reaction Index Scale (RIS) (Frederick, 1986). Dr. Kalayjian had

used the RIS with outreach programs for survivors of previous natural disasters, and this scale was originally chosen for its clarity and brevity.

The data collected in Turkey include approximately 440 survivors of the 1999 earthquake. These survivors lived in Izmit, Golcuk, or Istanbul, attended the MHOP program and completed the Reaction Index Scale and demographic questionnaire. The age of the participants ranged from 11 to 59 years (M=19.63, SD=13.25), with 196 of the participants being older than 16; the ages of forty-two people were missing. Also, 267 participants were women, 155 participants were men, and the gender of 18 participants was unknown.

3.5.2 Participants and Procedures for Sample 2:

Additional data were gathered from Turkey by self-administered questionnaires at the end of the 2001. The inclusion criteria was being an adult and living in the earthquake area at the time of the earthquake. In order to reach these participants, people who were involved and helped survivors such as psychologists, teachers, and local authorities were contacted to ask for help in finding the potential participants. Also, after the 1999 earthquake, several centers were opened to provide psychological help and consultation for earthquake survivors. These centers were located in or in close proximity to earthquake areas and they were run by mostly volunteer psychologists and psychiatrists and supported by the Turkish Psychological Association. These centers were contacted and they provided help in reaching potential participants and volunteered to be referrals if a referral was requested by the participants. By using these resources and personal contacts, potential participants were contacted by mail or phone.

After contacting the prospective participants via mail or phone, the aim of the study was explained to them. They were informed that their participation was completely voluntary and confidential, and they could withdraw from the study at any time. Once they agreed to participate, they were asked to complete the set of questionnaires. Approximately 210 questionnaires were distributed and 157 of them were returned. Therefore, the return rate was about 74.7 %.

Of the participants, 84 (53.5%) were women and 73 (46.5) were men. Eighty five (54.1%) participants were married, 65 (41.4%) were single, five (3.2%) were divorced, and two participants did not indicate their marital status. The number of children in the family ranged from 1 to 6. Most of the participants (50.3%) had no children. 15.3 % had only one child, 22.9 % had two children, and 8.4 % had three or more children. Finally, three participants did not indicate their number of children. Regarding education level, 8 (5.1%) participants reported holding a Ph.D degree, 10 (6.4%) participants had a M.A/M.Sc. degree, 61 (38.9%) participants had a B.A/B.Sc. degree, 36 (22.9%) participants had a high school degree, and finally 42 (26.7%) participants had a middle school degree. Of the participants, 39 (24.8%) classified their economic level as "good," 78 (49.7) as "middle," 24 (15.3%) as "lower middle" and 13 (8.3) as "bad." Three participants did not indicate their economic level.

These participants were also asked whether they received any psychological and/or material help after the earthquake. All of the participants reported that they received financial/material help from the government or other aid organizations. Two participants reported that they had attended one debriefing session but found it "not very helpful." These two participants wrote "they [experts leading the debriefing]

encouraged us to talk about our experiences during or after the earthquake. We have already been talking about the earthquake among each other anyway."

3.6 MEASURES

3.6.1 Procedure for Translation of Measures

With the exception of the Reaction Index Scale (RIS) and SCL-R inventory which were translated into Turkish as part of the previous research - each of the questionnaires used in this research needed to be translated into Turkish. These questionnaires were independently translated first into Turkish by 3 people who are graduate students in counseling or clinical psychology. The questionnaires were then exchanged and translated back into English. In other words, the translators did not translate their own Turkish translations back into English. Minor discrepancies between translations, such as specific idioms were resolved by discussion until an agreement was reached. These few idioms were replaced by regular statements that give the same/similar meanings. There was no disagreement at the end of the discussion. Later, ten people were asked to fill out the final version of questionnaires to check the clearness of each item. Each of the measures is described in the following paragraphs.

3.6.2 The Reaction Index Scale

PTSD symptomology was measured by The Reaction Index Scale (RIS). This scale (Frederick, 1986) includes 28 items. It has two distinct sections. The first section includes items 1-20 and is the symptoms section. The second section includes items 21-28 and is used to measure the onset and duration of the symptoms and the help seeking behavior related to the event; this second part does not contribute to the

total symptom scores. The symptom scale is a 5-point Likert-type scale (none of the time = 0; most of the time = 4) and the greatest possible total score is 80. Frederick considers raw scores of 25-39 to indicate moderate PTSD, 40-59 severe PTSD, and 60 or higher very severe PTSD (Haris & Riad, 1997). Frederick (1987) reported a test-retest alpha coefficient of .77 and high levels of agreement between determinations of caseness based on the RIS and the MMPI-PTSD scale. Haris & Riad (1997) reported that the RIS measures PTSD among victims of civilian trauma and has been used internationally in such places as Armenia, Italy, Mexico, Egypt, Norway, Uganda, Australia, The Dominican Republic, and Thailand; however, no reported reliability or validity information for these international samples was found. Our sample responded to 20 items by using a 7-point scale (1=strongly disagree; 7=strongly agree) and the reliability coefficient was found to be .88.

3.6.3 The Emotion Regulation Questionnaire

This questionnaire developed by Gross and John (2000) measures individual differences in emotion regulation with a 7-point Likert-type scale (1=strongly disagree; 7=strongly agree). It reports two types of emotion regulation scores. The first score is for expressive suppression, which is used "to rate the extent to which [participants] typically try to inhibit their emotion-expressive behavior (p.15)." The expressive suppression is a four item subscale and includes items such as "I keep my emotions to myself" and "I control my emotions by not expressing them." The second score is for appraisal, which is used "to rate the extent to which [participants] typically try to think about situations differently in order to change how they feel." The appraisal is a 6 item subscale and includes items such as "When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm" and

"I control my emotions by changing the way I think." The reliability alphas were reported as .77 for expressive suppression and .75 for reappraisal. For our sample, reliability coefficients ranged from .52 to .47 for the total and subscale scores.

3.6.4 Trait Meta-mood Scale (TMMS)

This scale developed by Salovey, Mayer, Goldman, Turvey, and Palfai (1995) was used to measure survivors' beliefs about their feelings. This measure aims to assess relatively stable individual differences in people's tendency to attend to their moods and emotions, discriminate clearly among them, and regulate them. Therefore, it has three subscales: Attention to Feelings, Clarity in Discriminating Feelings, and Mood Repair. Salovey and his colleagues examined its factor structure, convergent and discriminant validity and reported that TMMS is a reliable and valid measure for researchers interested in emotional disclosure and clarity subscale is an especially strong predictor of the unpleasant quality of ruminations after stressful experiences. This measure was chosen over other available measures because it is defined as particularly appropriate for studies interested in PTSD (Ansorge, Litz, & Orsillo, 1996). The scale has a total of 30 items. For the Turkish sample, a 7-point scale (1=strongly disagree; 7=strongly agree) was used and the reliability alphas were found as .77 for the total score, .72 for The Attention Sub-scale, .59 for Repair Sub-scale, and .66 for the Clarity Sub-scale.

3.6.5 Rumination Scale

Rumination is measured using part of a larger questionnaire called "Responses to Depression Questionnaire," which is a 71-item, 5-point Likert type scale. This scale was constructed by Nolen-Hoeksema and Morrow (1991) and has four distinct sections: the Ruminative Responses Scale, Distracting Responses Scale, Problem-

Solving Scale, and Dangerous Activities Scale. For this study, only 21 slightly modified versions of the Ruminative Responses Items were used (Ansorge, 1996). A sample item reads "Think about how alone you feel." For this scale, Cronbach's alpha of .89 was reported (Nolen-Hoeksema & Morrow, 1991). For this study a 7-point Likert type scale (1=strongly disagree; 7=strongly agree) was used and inter-item reliability was found as .90.

3.6.6 Level of Exposure

Level of exposure was measured using six questions that were developed as part of this research based on four questions that Nolen-Hoeksema and Morrow's developed (1999). These questions are as follows: 1. How much damage did the earthquake cause to the area where you were when the earthquake happened? 2. How much damage did the earthquake cause to your house? 3. How much stress did you experience by losing family members and/or close friends during the earthquake? 4. How much stress did you experience because your family members and/or close friends were injured by the earthquake? 5. How much stress did you experience because you were injured by the earthquake? 6. How much of your daily life has been inconvenienced as a result of earthquake? Participants responded to these questions using a 4-point Likert-type scale (1=none; 4=a great deal). The overall level of exposure score was calculated by combining these six ratings. The inter-item reliability coefficient for our sample was .71.

3.6.7 Psychological Distress

Psychological Distress was measured by the Turkish version of the SCL-R inventory. The original inventory consists of 90, 5-point Likert-type items. Uner (1991) examined the psychometric properties of the scale for Turkish people and

created a 40 item scale which clusters into four factors: Somatization, Depression, Phobic Anxiety, and Hostility/Irritability. Unver (1991) reported the .92 Cronbach alpha for the total scale. The Cronbach alphas for each factors varied from .72 to .85. This inventory was chosen because it is widely used in the U.S as well as in Turkey, and its sex and age norms have been reported. For our sample, the reliability coefficient of .95 was found for the total distress score. The reliability alphas for the subscales were .89 (Somatization), .89 (depression), .88 (Anxiety) and .81 (Hostility/Irritability).

Finally, demographic information was requested regarding participants' age, gender, economic and educational level, marital status, and number of children in the household. In addition, participants were specifically asked whether they received any psychological treatments and/or financial/material help after the earthquake.

CHAPTER IV

Results

4.1 Overview of Analyses

This study was designed to explore the applicability of DSM-IV's formulization of PTSD to Turkish earthquake survivors and to explore the impact of several variables on the development of PTSD. In this sense, this study includes two parts.

In the first part, exploratory and confirmatory factor analyses were performed on existing data collected after the 1999 Istanbul earthquake to test DSM-IV's PTSD model. The data used in this part consisted of 440 Turkish earthquake survivors' responses to The Reaction Index Scale developed by Frederick (1986). Frederick stated that this scale was developed based on DSM's three symptom clusters, which attempt to capture the universal human responses to trauma (personal conversation with Frederick, 2000).

In the second part, additional data were gathered from Turkey during February 2002 to examine the relationship between emotion regulation, meta-mood traits, rumination, age, gender, educational level and level of exposure, and posttraumatic stress reactions of Turkish people. These data include 157 earthquake survivors' responses to several questionnaire measures of PTSD, rumination, emotion regulation, meta-mood traits, and general distress.

The results of this second part are presented in two major sections. The first section focuses on the descriptive aspects of the sample and the results presented

include the means, standard deviations, and/or frequency distributions of age, income, education, number of children, economic level and so on. The second section contains the results from multiple regression analyses examining the correlations among several variables.

4.2 Examination of Symptom Structure of PTSD: Applicability of DSM-IV's Formulization

4.2.1 Descriptive Analyses of 1999 Data

The data collected in Turkey consist of a sample of approximately 440 survivors of the 1999 earthquake. These survivors lived in Izmit, Golcuk, or Istanbul, attended the MHOP program and completed the Reaction Index Scale and demographic questionnaire. The age of the participants ranged from 11 to 59 years (M=19.63, SD=13.25), with 55.6% of the sample being 15 years or older. The ages of forty-two people were missing. Also, 267 participants were women, 155 participants were men, and the genders of 18 participants were unknown.

4.2.2 Factor Analysis Results

Participants

Eighty cases were excluded due to data missing in one or more of the scale items or the presence of multivariate outliers, leaving 360 cases in the factor analysis. The final data included 225 women, 124 men and 11 participants who did not indicate their gender with a mean age of 21.8 years (range 10 to 59).

Data Screening and Missing Data

A total of 69 cases were deleted due to missing data in scale items. An additional 11 cases were identified as multivariate outliers and deleted. Examination

of the scale items revealed substantial problems with skew and kurtosis for several of the scale items. Transformations were considered; however, each item consists of a five-point scale, and the limited range of scores makes transformation of data ineffective. To deal with the nonnormality, the Satorra-Bentler Scaled χ^2 statistic (Satorra & Benter, 1988) was used. This statistic accounts for nonnormality, reducing the problems resulting from the skew and kurtosis exhibited by these data because it is more robust to violations of non-normality.

Since nearly 16% of the cases in the original data set proved unusable due to missing data, questions arose as to why these data were incomplete. To address this issue, the cases with missing data were compared to those cases without missing data. A comparison of the average scores on the Reaction Index Scale using all scale items with responses indicated that those individuals with missing data ($\underline{M}$ = 2.92) scored similarly to the individuals without missing data ($\underline{M}$ = 2.88), $\underline{t}(434) < 1$, $\underline{p} = .54$, $\eta^2 = .00$. The age and gender of the individuals with missing data ($\underline{M}$=22.9 years, 63% women) were also similar to those individuals without missing data ($\underline{M}$=21.6 years, 64% women), $\underline{t}$ (396) < 1, $\underline{p} = .46$, $\eta^2 = .00$, X^2 (1) = .04, $\underline{p} = .85$, respectively. These results suggest that those individuals who did not answer all of the scale items did not differ significantly from those individuals who completed all measures.

Model Testing

Multiple models were tested using confirmatory factor analysis to determine which model fit the data the best. For the purposes of these analyses, an adequate model fit was defined as having a ratio of X^2 to degrees of freedom of no more than approximately 2 to 1, a root mean square error of approximation (RMSEA) below .10, and a Comparative Fit Index (CFI) and Robust Comparative Fit Index of .90 or

higher (Tabachnick & Fidel, 1996). Superseding statistical criteria is parsimony. Good model fit requires that models be simple and easy to interpret.

DSM-IV Model

The first model, represented in Figure 1, tested a DSM-IV derived factor structure. This analysis tested the fit of 16 of the variables onto three factors, Avoidance/Numbing, Reexeperiencing, and Arousal. Table 1 presents the fit indexes for several DSM-IV based models. The initial orthogonal model fit the data poorly but did indicate an improvement over the independence model. The second model tests an oblique solution, adding covariance paths between the three factors. While the oblique model significantly improved the model fit, it did not produce a good model fit overall. Since neither model fit the data well, the Langrange Multiplier test for adding parameters was used to improve the model fit. Based on this test, several additional paths were added and two paths were deleted to create a model that fit the data reasonably well. The final model, represented in Figure 2, adequately fit the data but failed to establish parsimony. Given the number of path additions needed to establish model fit, it was concluded that the DSM-based model does not fit these data.

Establishing a Model of Best Fit

Given the inadequacy of the DSM-IV factors, an appropriate factor structure for these data was investigated. Performing a principal components analysis with varimax rotation on these data resulted in three factors being extracted based on their eigenvalues. These three factors explained 57% of the variance in the scale variables. Table 2 shows factor loadings. These three factors were tentatively labeled Reexperiencing/Arousal, Cognitive Impairment, and Numbing. Based on the factor

structure suggested by this exploratory analysis, confirmatory factor analysis was utilized to establish the model fit and improve the model. Figure 3 represents the first model. As shown in Table 1, this model did not provide a good fit to the data. However, this model outperformed the initial DSM based model. The second model tested was an oblique model that allowed the three factors to correlate. This model fit the data adequately and is simple, parsimonious, and easy to interpret.

Comparing Older and Younger Participants

A multi-sample covariance analysis fitting the derived factor structure to both older (n = 167; over 15 years old) and younger (n = 167; 15 years or less) participants indicated that only three of the 21 paths differed significantly between the groups. Similar and correlated three factor structures emerged for the two groups. A Lagrange multiplier was used to decide which three factor structures were significant at the <.05 level. This analysis compared the fit of the factor structure between the groups, yielding a test of whether the factor structure is applicable to both older and younger participants. This analysis indicated that the factor structure fit both the adult and children data adequately, χ^2 (279) = 549.4, χ^2: df = 1.97, CFI = .901, RSMEA = .054. Therefore, based on these results, it was decided that the three factor structures for the adults and children are similar and that the collapsed analyses above are appropriate.

4.3 Examination of the Relationship between Risk/Resilience Variables and the Development of PTSD Using Multiple Regression Analysis

4.3.1 Ratio of Cases to Predictors

Before utilizing multiple regression models, the ratio of cases to predictors was defined. Tabachnick and Fidell (1996) suggested that "the simplest rule of

thumb are N>50+8m (m is the number of predictors) for testing the multiple correlation and N>104+m for testing individual predictors. These rules of thumb assume a medium-size relationship between the independent and the dependent variables, $\alpha = .05$ and $\beta = .20$" (p. 132). Based on an examination of the correlation coefficients, it was decided that 11 predictors would be included in the multiple regression analyses for this study. Therefore, the required sample size was defined as 138 for testing multiple regression models and 116 for testing individual predictors. Tabachnick and Fidell (1996) suggested the use of one or both of these rule of thumbs for defining the required sample size. Since the initial sample size was 157, it was concluded that the sample size was large enough to run the multiple regression analyses.

4.3.2 Assumptions Testing

All dependent and independent variables were tested for assumptions of normality, linearity, multicollinearity, and outliers. For the normality assumption, descriptive analyses were conducted and skewness and kurtosis values were examined. Morgan and Griego (1998) suggested a rule of thumb for testing normality: normality is violated if the skewness and/or kurtosis measure is more than 2.5 times its standard error. Based on this rule of thumb, the age variable was found to be skewed. The age variable was also not correlated with the criterion variable and thus it was not included in the analyses. Later, histograms for the skewed variable as well as for all the other variables were checked to evaluate the severity of violations as well.

For the linearity assumption, scatterplots and correlation coefficients were examined. No nonlinear relationships between the criterion variable and the

predictors were observed. Correlation coefficients for the criterion variables and all predictor variables were examined for multicollinearity as well as linearity. Multicollinearity was also checked and no serious problems were observed. Correlation coefficients among all variables are presented in the Table 3, 4, and 5.

Finally, screening for outliers was performed through a residual analysis after an initial regression run. Based on SPSS's casewise diagnostics ("outliers outside 3 standard deviations") analysis, case 53 was found to be an outlier and was deleted to prevent its impact on the regression solutions.

4.3.3 Intercorrelations Among Predictors

Mostly mild to moderate correlation coefficients were found among predictors of the study (see Table 3). Ideally, there should be no correlations among the predictor variables because regression solutions are extremely sensitive to the combination of included variables, but this is hardly the case (Tabachnick & Fidel, 1996). Therefore, the tolerance values generated by the regression collinearity statistics were given special attention to determine the strength of the relationship between the predictor values. When tolerance values were less than .01, variables were considered multicollinear (Brace, Kemp, & Snelgar, 2000). The results suggested that there were no severe violations of multicollinearity assumptions. As expected, medium to strong correlation coefficients were found between total scale scores (meta-mood traits and emotion regulation) and their subscale scores. Table 3 shows all intercorrelations among predictor variables and the means and standard deviations for each variable.

4.4 Intercorrelations Between PTSD and General Distress Variables

A criterion variable for the study was The Reaction Index Scale (RIS). The RIS was used as a measure of PTSD and was the main interest and thus was the criterion variable of the study. General distress level (SCL-R) was also measured to find out whether any overlaps exist between the measures of RIS and SCL-R and its subscales (Depression, Somatic Reactions, Anxiety, and Hostility). As shown in Table 4, RIS and SCL-R were significantly correlated ($r(149)=.69$, $p<.0001$). Their subscale scores were also moderately to robustly correlated with coefficients ranging from .36 to 70. These levels of correlations suggested that while there was some overlap in these two scales, they also appeared to represent separate and unique constructs. For this study, only the total score of the RIS was used as the criterion variable.

4.5 Intercorrelations Between The Criterion and The Predictor Variables

Another correlation matrix was created to examine the relationship among demographic, predictor, criterion variables and general distress level, and the correlation coefficients are presented in Table 5. No curvilinear relationship was observed between the criterion variable and the predictor variables.

The RIS was significantly correlated with the number of children ($r(148)=.195$, $p<.017$), education level ($r(152)=-.39$, $p<.0001$), economic level ($r(148)=.24$, $p<,004$), and gender ($r(152)=-.17$, $p<.040$).

The RIS was also found to be correlated with level of exposure ($r(148)=.52$, $p<.0001$), rumination ($r(148)=.56$, $p<.0001$), repair ($r(146)=-.29$, $p<.0001$), clarity ($r(144)=-.34$, $p<.0001$), and suppression ($r(149)=.29$, $p<.0001$).

Based on the literature review, age was initially planned to be included as a predictor variable; however, no significant correlation coefficients were found between age and the RIS, and thus the age variable was excluded from the multiple regression analyses because it was not expected to add anything to the prediction of PTSD. Also, the correlation coefficient between the attention scores and PTSD was not significant, and it was excluded from the regression models as well. The total number of predictors was 11: gender, number of children, education level, economic level, level of exposure, rumination, repair, clarity, emotion regulation, suppression, and meta-mood traits. Of these predictors, number of children, education and economic level were introduced in hierarchical analyses as the control variables.

4.6 Multiple Regression Analyses

In the following section, the findings of the hierarchical multiple regression analyses are presented. A separate hierarchical multiple regression analysis was run for each predictor. Hierarchical multiple regression analysis allows researchers to determine the sequence of predictors based on logic or a theory. For this study, it was predicted that individual predictors would have greater theoretical importance than the demographic variables found to be correlated with the criterion variables. It is possible to enter all of the predictors in one analysis if the order of entry of predictors can be justified based on theory. However, since a particular entry order for the predictors could not be justified, as this was an exploratory analysis, a separate hierarchical analysis was run for each predictor.

4.6.1 Hypothesis 1: Personal Factors

It was hypothesized that age and gender will be associated with PTSD. More specifically,

1a) The age of the participants will be related to levels of PTSD even after controlling for the effects of demographic variables (gender, education, economic level, and number of children).

1b) Women are more likely to report higher levels of PTSD even after controlling for the effects of demographic variables (age, education level, economical level, and number of children).

Findings for Hypothesis 1a-Age

Based on a preliminary analysis, age was found to be uncorrelated with the level of PTSD and thus regression analysis was not utilized for this hypothesis.

Findings for Hypothesis 1b-Gender

The control variables (number of children, education level, and economic level) were entered in step 1; the R squared was significant and accounted for 16 % of the variance in PTSD (R-Squared =.160, F (3, 144)=9.11, p=.0001. Education level made a significant contribution to the variance accounted for in PTSD (β =-.35, p = .0001), indicating that participants who reported having higher education levels also reported having lower levels of PTSD.

After controlling for the effects of the demographic variables in Step 1, the variable of gender was included in Step 2; the change in R-squared for Step 2 was not significant (R Squared Change=.016, F (1, 143)=2.86, p=.093). However, a trend was observed for the effect of gender on PTSD, indicating that women are more likely to report higher levels of PTSD.

The overall regression model predicting the development of PTSD using gender along with the number of children, and education and economic levels explained a significant amount of variability in PTSD (Adj. R^2 = .153, F (4,143) =

7.6, p = .0001). The full model accounted for 15 % of the variance in PTSD. These findings are summarized in Table 6.

4.6.2 Hypothesis 2: Level of Exposure:

It is hypothesized that the level of exposure to the earthquake will be associated with PTSD even after controlling for the effects of age, gender, economic and education level, and number of children. More specifically, the greater the level of exposure as measured using The Distress From The Earthquake scale will be related to higher levels of PTSD as measured by The Reaction Index Scale.

Findings for Hypothesis 2-Level of Exposure

The control variables consisting of number of children, gender, education level, and economic level were entered in step 1; the R squared was significant and accounted for 17% of the variance in PTSD (R Squared =.174, F (4, 141)=7.409, p=0001). Education level made a significant contribution to the variance accounted for in PTSD (β =-.32, p = .0001), indicating that participants who reported having higher education levels also reported having lower levels of PTSD.

After controlling for the effects of the demographic variables in Step 1, level of exposure was included in Step 2; the change in R-squared for Step 2 was significant and accounted for 16.8% of the variance in PTSD (R-Squared Change=.168, F (1, 141)=35.68, p=.0001).

The overall regression model predicting the development of PTSD from the levels of exposure along with the number of children, gender, education and economic levels explained a significant amount of variability in PTSD (Adj. R^2 = .318, F (5,140) = 14.521, p = .0001). The full model accounted for 32% of the variance in PTSD. These findings are summarized in Table 7.

4.6.3 Hypothesis 3: Personality Type Factors

It is hypothesized that some cognitive and emotional characteristics of earthquake survivors will be associated with PTSD even after controlling for the effects of age, gender, economic and education level, marital status, and number of children. More specifically,

3a) Rumination

Levels of rumination as measured by The Rumination Scale will be related to PTSD as measured by The Reaction Index Scale even after controlling for the effects of gender, education and economic level, and number of children.

Findings for Hypothesis 3a Rumination

The control variables number of children, education level, and economic level were entered in step 1; the R-squared was significant and accounted for 16% of the variance in PTSD (R-Squared =.172, F (4, 140)=7.296, p=0001). Education level made a significant contribution to the variance accounted for in PTSD (β =-.324, p = .0001), indicating that participants who reported having higher education levels also reported having lower levels of PTSD.

After controlling for the effects of the demographic variables in Step 1, rumination was included in Step 2; the change in R-squared for Step 2 was significant and accounted for 21% of the variance in PTSD (R-Squared Change=.212, F (1, 149)=47.9.0, p=.0001).

The overall regression model predicting the development of PTSD from rumination along with number of children, gender, education and economic levels explained a significant amount of variability in PTSD (Adj. R^2 = .362, F (5,139) =

17.37, p = .0001). The full model accounted for 36 % of the variance in PTSD. These findings are summarized in Table 8.

3b) Emotion Regulation

3b1. Reappraisal

It is hypothesized that appraisal will be associated with PTSD even after controlling for education and economic level, gender, and number of children.

3b2. Suppression

It is proposed that suppression will be negatively associated with PTSD even after controlling for education and economic level, gender, and number of children.

Findings for Hypothesis 3b1. Reappraisal and Suppression

Reappraisal was not correlated with the criterion variables and thus it was not included in the regression analysis.

Suppression: The control variables number of children, gender, education level, and economic level were entered in step 1; R-squared was significant and accounted for 17% of the variance in PTSD (R-Squared =.169, F (4, 141)=7.19, p=.0001). Education level made a significant independent contribution to the variance accounted for in PTSD (β =-.320, p = .001), indicating that participants who reported having higher education levels also reported having lower levels of PTSD.

After controlling for the effects of the demographic variables in Step 1, suppression was included in Step 2; the change in R-Squared for Step 2 was significant and accounted for 5% of the variance in PTSD (R-Squared Change=.045, F (1, 140)=8.026, p=.005).

The overall regression model predicting the development of PTSD from suppression along with number of children, gender, education and economic levels explained a significant amount of variability in PTSD (Adj. R^2 = .186, F (5,140) = 7.640, p = .0001). The full model accounted for 19 % of the variance in PTSD. These findings are summarized in Table 9.

3c) Meta-Mood Traits

3c1. Clarity in discriminating feelings

3c1. Clarity in emotional experiences will be negatively related to levels of PTSD even after controlling for education and economic level, gender, and number of children.

Findings for Hypothesis 3c1-Clarity in Discriminating Feelings:

The control variables number of children, gender, education level, and economic level were entered in step 1; R-Squared was significant and accounted for 18% of the variance in PTSD (R Squared =.183, F (4, 136)=7.6, p=.0001). Education level made a significant contribution to the variance accounted for in PTSD (β = -.317, p = .001), indicating that participants who reported having higher education levels also reported having lower levels of PTSD.

After controlling for the effects of the demographic variables in Step 1, clarity was included in Step 2; the change in R-Squared for Step 2 was significant and accounted for 8% of the variance in PTSD (R Square Change=.079, F (1, 135)=14.42, p=.0001).

The overall regression model predicting the development of PTSD from clarity along with the number of children, gender, education and economic levels

explained a significant amount of variability in PTSD (Adj. R^2 = .234, F (5,135) = 9.6, p = .0001). The full model accounted for 23 % of the variance in PTSD. These findings are summarized in Table 10.

3c2. Attention to emotional experiences

3c2. Attention to emotional experience will be negatively related to levels of PTSD even after controlling for education and economic level, gender, and number of children.

Findings for Hypothesis 3c3: Attention was not correlated with the level of PTSD and thus it was not included in the regression analysis.

3c3.Mood repair

3c3. Mood repair efforts will be negatively related to levels of PTSD even after controlling for education and economic level, gender, and number of children.

Findings for Hypothesis 3c3. Mood repair

The control variables number of children, gender, education level, and economic level were entered in step 1; the R squared was significant and accounted for 18% of the variance in PTSD (R Squared =.182, F (4, 138)=7.68, p=.0001). Education level made a significant contribution to the variance accounted for in PTSD (β =-.317, p = .001), indicating that participants who reported having higher education levels also reported having lower levels of PTSD.

After controlling for the effects of the demographic variables in Step 1, mood repair was included in Step 2; the change in R-Squared for Step 2 was significant and

accounted for 8% of the variance in PTSD (R-Squared Change=.078, F (1, 137)=14.36, p=.0001).

The overall regression model predicting the development of PTSD from mood repair along with the number of children, gender, education and economic levels explained a significant amount of variability in PTSD (Adj. R^2 = .233, F (5,137) = 9.61, p = .0001). The full model accounted for 23 % of the variance in PTSD. These findings are summarized in Table 11.

CHAPTER V

Discussion

5.1 INTRODUCTION

The goal of this study was to examine the fit of DSM's PTSD symptom structure to Turkish earthquake survivors and to examine the strength of association between several variables and the development of PTSD. In addition, the study aimed to look at these issues in a culture specific context, because most of the knowledge on trauma and emotional experiences has been produced based on western cultural premises and imported to other international cultures. The hope is to fill this gap by examining the appearances of several features of trauma and of emotional experiences in Turkish culture. The study includes two distinct parts.

In the first part, confirmatory and exploratory factor analyses were utilized to test the symptom structures of PTSD as defined by DSM-IV. This was one of the main interests because despite the widespread use of DSM as a primary diagnostic tool, its fitness to international populations in terms of the DSM-specified clustering of symptoms has not been examined. Even within western cultures, several previous studies have failed to confirm the symptom structure of PTSD for different traumatic events. These studies raised substantial concern regarding the use of DSM's PTSD formulation, especially regarding its symptom structures. These previous studies have also used different methodologies to examine PTSD's symptom structure. For example, most of the researchers have only used exploratory factor analysis, which is less helpful for model testing than confirmatory factor analysis, and the few studies

that have used confirmatory factor analysis have failed to confirm the three factor structures of PTSD. Therefore, the study reported here used both confirmatory and exploratory factor analyses.

In the second part, based on previous studies, several risk and/or resilience variables were combined to examine their strength of association to the development of PTSD. For this study, the variables were level of exposure, which was defined based on the distress caused by the earthquake, personal variables such as age and gender, and personality variables such as emotion regulation, rumination, and meta-mood experiences.

5.2 SYMPTOM STRUCTURES OF PTSD

Confirmatory factor analysis failed to confirm the three factor structures (avoidance/numbing, reexperiencing, and arousal) reported by DSM-IV. The results of the exploratory factor analysis suggested a different factor structure for the Turkish earthquake survivors: reexperiencing/arousal, cognitive impairment, and numbness. This study offers support to previous studies that reported poor fit of the DSM model to different traumatic experiences and populations (e.g., McMillen, North, & Smith, 2000; Buckley, Blanchard, & Hickling, 1998; King, Leskin, King, & Weathers, 1998). In an earlier study, Smith and North (1993) claimed that due to low rates of diagnosable PTSD syndromes, symptoms might cluster differently.

This study revealed that reexperiencing and arousal are one cluster instead of two different clusters as proposed in the DSM conceptualization. Although causality cannot be established based on this study, it may be speculated from this close relationship between reexperiencing and arousal that recurrent, intrusive, and distressing recollections of the traumatic events may trigger heightened emotional

arousal. Morgan (1997) reports that exaggerated startle response may be state dependent, and emotional arousal can be produced by reminders of traumatic experiences. Kennedy-More and Watson (2001) also discussed that avoidance is less likely to generate heightened cardiovascular arousal. Therefore, it is not surprising that reexperiencing and arousal symptoms were found to be associated. In essence, a person who reports a high level of reexperiencing symptoms is likely to report arousal symptoms as well.

The results of this study also indicate that avoidance symptoms may not arise simultaneously with numbing symptoms as DSM suggests. The items indicating avoidance were not grouped together and numbing responses emerged as a separate symptom cluster. This result offers support for the previous studies that reported that avoidance and numbing responses should be seen as separate mechanisms. Foa, Zinbarg, and Rothbaum, (1992), for example, describe that unlike numbing, avoidance is a strategic effortful mechanism. Similarly, Anthony, Lonigan, and Hecht (1999) make a distinction between active avoidance (e.g., avoiding trauma related thoughts by engaging in distractive activities and social interactions) and passive avoidance (withdrawal from any activities).

Interestingly, numbing emerged as a separate, unique factor for this study while most previous studies, especially international epidemiological studies, report that numbing responses are less likely to be reported in the case of natural disaster induced trauma. In one of these studies, Jenkins (1996) examined the cultural validity of the PTSD diagnostic categories using anthropological interviews with Salvadoran women refugees and reported that criterion C (numbing/avoidance) was not common. This author specified that a “feeling of detachment, estrangement, restricted affect,

foreshortened future, or inability or unwillingness to narrative the traumatic situation were not marked" whereas criterion A (reexperiencing) and criterion D (arousal) were clearly observed. Basoglu, Salcioglu, Livanou, Ozveren, Aker, Kilic, and Mesticioglu (2001) attempted to develop a measure that reflects DSM-IV's PTSD and depression criteria shortly after the 1999 earthquake in Turkey. Their study states some difficulty identifying avoidance and numbing types of symptoms as well. Although their Turkish sample clearly reported numbing symptoms, avoidance symptoms were not as common. Unlike Jenkins (1996), Basoglu et. al (2001) concluded that DSM-IV's criteria are applicable to Turkish culture despite some possibility of confusion between PTSD and depressive symptoms. However, these two studies relied on relatively small sample sizes and they are not factor analytic studies as they aimed to look at the prevalence or frequency of symptoms of PTSD in the culture studied.

The results of the present study suggest a new factor, cognitive impairment, which was not reported as a separate factor before. Cognitive impairments have been widely reported in the previous studies as a result of traumatic events in the form of difficulties in concentration and memory dysfunction (e.g., Wolfe & Charney, 1991) but it has never been considered as an independent symptom cluster. A study by Vasterling, Brailey, Constans, and Sutker (1998) is significant because it demonstrates how cognitive impairment is related to other symptom clusters. These authors studied attention and memory performance in Persian Gulf War veterans with and without PTSD diagnoses and reported that veterans with a PTSD diagnosis performed poorly relative to other groups on tasks of sustained attention, mental manipulation, and recall. They found a significant positive relationship between

cognitive intrusion and reexperiencing clusters, but the relationship between cognitive intrusion and numbing was negative. Finally, their results revealed an insignificant relationship between arousal and cognitive intrusion.

Therefore, cognitive functions and their relationship to traumatic reactions seem to require more attention. Cognitive impairment might seem to resemble somatic complaints (Hough, Canino, Abueg, & Gusman, 1996) and the results of this study revealed significant correlations between cognitive impairment and somatic reactions. International studies from Latin American (e.g., Norris, Weisshaar, Conrad, Diaz, Murphy, & Ibanez, 2001; Jenkins, 1996) and Asian Countries (Abueg & Chun, 1996) report overwhelming somatic symptoms as a result of natural and human made traumas.

Although this study clearly suggests a different factor structure for Turkish earthquake survivors, the results need to be cross validated with larger data sets that include different types of trauma and different populations to whom more than one PTSD assessment tool was administered. Also, qualitative approaches can be very fruitful in terms of developing culturally sensitive measures that reflect the ways indigenous people who are exposed to traumatic events create a meaningful narrative of their experiences.

Inconsistent results that are reported by previous studies and the results of this study regarding the symptom structures of PTSD suggest that the factor structure of PTSD may differ from population to population. Regardless of the cultural background of the population and the types of traumatic events, PTSD symptoms are manifested by the survivors, although the ways that people experience PTSD symptoms differ from population to population. It is difficult to conclude at this point

whether the cultural background of Turkish earthquake survivors is solely responsible for the different factor structure given the fact that a variety of factor structures were reported even by the studies that looked at North American populations. Furthermore, like most other disaster studies, this study could not compare the results of factor analyses in another equivalent cross-cultural sample in terms of content, conceptualization, scale, technical and normative equivalencies (for more discussion on kinds of equivalencies, see Keane, Kaloupek, and Weathers, 1996).

However, the impacts of culture on traumatic reactions cannot be ignored. The current literature, which is mostly anthropological on emotions, culture and psychopathology, shows that there are very clear cultural variations in human's traumatic reactions, manifestation of symptoms, and ways of coping with psychological difficulties. At this point in time, it is believed that PTSD is both a universal and culture-bound syndrome (Marsella, Friedman, Gerrity, & Scurfield, 1996). It is vital to keep these ethnocultural variations in mind because prevention and treatment models rely on the diagnostic formulations of PTSD.

5.3 Risk Factors For The Development of PTSD

Hierarchical multiple regression analyses were utilized in this study to test the contributions of several factors to the development of PTSD. Hierarchical multiple regression analyses allow for the control of the effects from demographic variables and explain the variance contributed by each predictor over and above the controlled variables.

5.3.1 Personal Factors

For this study, it was hypothesized that age and gender would be significantly related to PTSD. Age was not significantly correlated to PTSD and only a trend was

found for the relationship between gender and PTSD, with women being more likely to report PTSD symptoms than men.

The current literature provided inconclusive results concerning the relative vulnerability of different age groups. While some researchers report that due to a lack of resources, older people are more vulnerable to trauma (e.g., Cohen & Ahearn, 1980), other researchers claim that younger adults are more vulnerable (e.g., Knight, Gatz, Heller, & Bengtson, 2000) because they bear more responsibilities for their children and elderly family members. Also, some researchers suggest a curvilinear relationship between age and traumatic reactions (Thompson, Norris, & Hanacek, 1993). The results of this study are in line with studies that failed to find any relationship between age and PTSD (Miller, Turner, & Kimball, 1981; Ollendick & Hoffman, 1982). It is important to note that the age variable for this study was skewed, with the participants of the study being relatively young. While the range for age was 17 to 61 years old, about 75% of the participants were 35 years old or younger. However, square root transformation of the age variable did not change the relationship between age and PTSD scores.

Although this study also failed to confirm the relationship between gender and posttraumatic stress disorders, a trend was found: women tend to report more PTSD symptoms than men. Previous studies offer somewhat inconsistent results about this relationship but the majority of the studies report that women are more likely to develop psychological difficulties after traumatic events. The studies in which women are found to be more vulnerable to PTSD examined mostly human-made trauma where women are more likely to be the victims of violence, such as rape and domestic violence. However, disaster studies report no direct adverse effect on women

(Solomon, Smith, Robins, & Fischbach, 1987; Horowitz, Wilner, Kaltreider, & Alvarez, 1980).

In addition to the type of trauma, previous studies discussed several mediating effects between gender and PTSD, such as symptom types (Gibbs, 1989; Manuel, Anderson, 1993; Myers, Weissman, Tisherler, 1984), progress of recovery (Krause, 1987), timing of measure, demographic variables such as education level and economic level, and finally pre-disaster functioning (Phifer, 1990). Regarding this literature, Phifer (1990) maintains "virtually any pattern of sex differences imaginable has been found in prior research" (p. 413). However, his study on older populations found that women and men do not differ in symptoms of depression and/or anxiety. He explains that controlling for pre-disaster functioning might be the cause of the differences found between the results of his study and those of previous studies, because in previous studies the predisaster psychological functioning was not being controlled.

A Meta-analytic study by Brewin, Andrews, and Valentine (2000), which examines the risk factors for PTSD, indicates that a greater effect size for the female gender is likely to be found when researchers utilize structured interviews rather than use self-report questionnaires. Unlike age and gender, education level was found to be significantly related to PTSD. Participants with lower education levels reported more severe levels of PTSD. This finding is in line with previous studies by Lewin, Carr, and Webster (1997) and Phifer (1990).

5.3.2 Characteristics of The Traumatic Event

As predicted, the more damage and personal losses that survivors of the earthquake were exposed to, the more PTSD symptoms survivors showed after the

earthquake. Exposure to the traumatic event is one of DSM's criteria (Criterion A) and has been a controversial aspect of PTSD formulation. The reason for this controversy is that many people who witnessed/experienced the same traumatic event do not manifest pathological symptoms. Researchers discussed several explanations for this matter, such as the types of traumatic events studied and methodological difficulties (how to measure and/or conceptualize "exposure"). Also, the type of traumatic event seems to be related to different kinds of psychological difficulties (see Briere & Elliott, 2000, for a summary). More recent research argues that the individual's unique experiences during the traumatic event is more likely to predict PTSD than only being physically present during the event and/or the magnitude of the disaster itself. For example, Briere and Elliott (2000) found that disaster characteristics such as physical injury, fear of death, and property loss were better predictors of psychopathology than the type of disastrous event even after controlling for past violence history.

Unlike most other studies in which only one or two aspects of exposure to disasters were measured, this study included more comprehensive levels of exposure by incorporating psychological distress due to physical damage to the geographical area and the place of residency, physical injuries to themselves and family members, death of family members, and inconveniences in daily life due to the earthquake. The results of this study clearly indicate that even 2 years after the earthquake, the level of exposure is closely associated with PTSD and general stress.

Examining the level of exposure and the distress caused by the disaster is crucial because unlike other types of psychological problems, PTSD has a clear

starting point, a traumatic event, and thus it is important to understand how people experience and interpret the traumatic event.

5.3.3 Personality Factors

As hypothesized, earthquake survivors who ruminate are more likely to have PTSD regardless of their demographic characteristics such as gender, education and economical level. The results of this study are in line with Nolen-Hoeksema and Morrow ‘s (1991) study in which a ruminative style was found to be a significant predictor of both depression and PTSD after the 1989 Loma Prieta Earthquake. People who ruminate are more likely to be at risk to the development of PTSD because rumination is a passive and repetitive way of dealing with emotional upheavals (Nolen-Hoeksema & Davis, 1999). Previous studies established that ruminators are more likely to be pessimistic, to be unwilling to engage in activities (Lyubomirsky & Nolen-Hoeksema, 1993), to be poor problem solvers due to negative self-criticism, to self-blame for the problems, and to have low self-confidence and perceived control (Lyubomirsky, Tucker, Caldwell, & Berg, 1999).

Social sharing is defined as the opposite of rumination (Nolen-Hoeksema & Davis, 1999; Lepore, Silver, Wortman, & Wayment, 1996; Rime, 1997). In light of the results obtained from this study and from previous studies, people who do not share their traumatic experiences but instead passively ruminate about them are more prone to PTSD. As discussed in the literature review section, cognitive theories explain that rumination might be responsible for intrusive thoughts and rebounding effects. People with PTSD suffer from two distinctive emotional experiences: reexperiencing and suppression. Since reexperencing the trauma creates intense negative emotions, trauma survivors try to suppress or avoid any trauma related

thoughts. However, attempts to suppress trauma related thoughts or emotions creates a vicious cycle. This cycle can be broken by sharing the trauma related thoughts and emotions in a supportive environment. As explained earlier, when people express their thoughts and emotions, they reconstruct their cognitive schema (Greenberg, Wothman, & Stone, 1996) and develop habituation (Roemer & Borkovec, 1994). Social sharing also reduces both psychological distress (Nolen-Hoeksema & Davis, 1999) and somatic complaints (Pennebaker, 1995).

In this sense, it is not surprising that suppression as a type of emotion regulation is also found to be negatively related to the level of PTSD. In other words, people who suppress their feelings tend to report more PTSD symptoms than people who do not suppress. The other type of emotion regulation, reappraisal, was not found to be associated with PTSD.

Emotion regulation is described as a process in which people influence their emotions in terms of how and when they express them (Gross, 1998). Suppression and reappraisal are two different ways of regulating emotions. While suppression is a "response-focused emotion regulation" and occurs after the emotion is already generated as a result of the event, reappraisal is a process where regulation is initiated before the emotion is generated. In an experimental setting, Richards and Gross (2000) examined the impacts of suppression and reappraisal on cognitive functioning. They demonstrated that while suppression negatively impacted the cognitive functioning, primarily through poorer memory, reappraisal had no adverse effect on cognitive functioning, such as verbal performance or cued-recall memory. The authors explained that suppression requires more extensive activation of cognitive resources to monitor and control emotions than does reappraisal and thus relative to

reappraisal, suppression leads people to perform poorly on the cognitive tasks. Reappraisal may have relatively fewer costs than suppression. Moreover, the authors discussed that people who used suppression as a way of regulating their emotions might have relatively more difficulties in social relationships because these cognitive difficulties impair their communication skills.

In light of these findings, it can be speculated that suppression is negatively associated with PTSD but reappraisal is not because suppression consumes more cognitive resources than reappraisal. Lanius and Hopper's (2002) study of neuroimaging of PTSD reports more brain activity during the suppression state than during a hyperarousal state. They offer evidence from a neurobiological perspective. Also, this study revealed a significant positive correlation between cognitive impairment and suppression. Reappraisal, however, was found to be correlated with cognitive impairment, which is found as an individual factor for this study. Therefore, this study suggests that the relationship between emotion regulation and PTSD differs, depending on the type of emotion regulation being utilized.

As predicted, meta-mood traits are associated with the development of PTSD. For this study, meta-mood traits were measured as clarity in discriminating feelings, attention to feelings and mood repairs. The results of this study revealed that clarity in discriminating feelings and belief that mood can be repaired were negatively associated with severity of PTSD. Attention to feelings, however, was not related to level of PTSD, meaning that people who attend to their feelings neither benefited nor were harmed by them.

Earlier studies discussed that beliefs and attitudes about emotions directly related to emotional experiences (Kelly & Kahn, 1994) as well as physical health

(Salovey, Detweiler, Steward, & Rothman, 2000) and reported similar research findings to our study. The effects of meta-mood in war-induced posttraumatic stress disorders were studied by Ansorge, Litz, and Orsillo (1996) for veterans with and without PTSD diagnoses and demonstrated that dysfunctional attitudes such as problems with affect tolerance and affect regulation were related to PTSD. In other words, veterans with PTSD in their sample were found to be less clear about their emotional states, have less acceptance for their emotions, and were less likely to repair their negative emotions.

Similarly, Salovey, Mayer, Goldman, Turvey, and Palfai (1997) studied meta-mood traits in an experimental setting with a non-clinical sample and reported a negative relationship between clarity in discriminating feelings and intrusive or ruminative thoughts. Mood repair was also found to be associated with lower levels of negative affect but attention was not. The authors speculated that clarity and mood repair buffer the impact of a stressful event. Clarity and mood-repair help people to reduce their ruminative thoughts because "they know how they feel; they do not need to engage in prolonged rumination in order to figure it out. Rather, they can turn their attentional resources toward coping and minimizing the impact of the stressful event" (p.146). Additionally, these authors claimed that people are more likely to attend to aversive feelings that exacerbate stressful experiences.

5.4 Brief Summary and Clinical Implications

In summary, level of exposure, rumination, and emotional experiences such as suppression, clarity in discriminating feelings, and mood repair are closely associated with the development of PTSD. While people with high levels of exposure, ruminative personalities, and suppressive type of emotion regulations are more likely

to report PTSD symptoms, people with a high clarity in discriminating feelings and a belief that mood can be repaired are less likely to report PTSD symptoms. The results of this study contribute evidence to cognitive and emotional processing theories in terms of clarifying the relationship between these factors and PTSD.

Cognitive theories of posttraumatic reactions maintain that individuals evaluate, interpret, and integrate new information based on their preexisting schema, which consist of past experiences, beliefs, and assumptions regarding self, safety, and future events. When people are exposed to traumatic events, evaluating and/or interpreting the new information takes a long time and results in great stress due to the contradictory and confrontational nature of traumatic experiences to their preexisting schema. The greater the confrontation, the larger the resulting stress. In other words, the greater the severity of exposure to the traumatic event, the greater the severity of PTSD. Until the traumatic experience is integrated into their existing schema, it is stored in the active memory and continuously produces intrusive and emotionally upsetting thoughts.

As a first step mental health professionals who work with trauma survivors may want to assess where the survivors are in this integration process and to identify the factors that make the integration process difficult for the survivor, such as the severity of exposure. Survivors who experience numbing symptoms may need different types of interventions than survivors experience reexperiencing/ arousal symptoms. More individual specific assessments and treatment approaches may be more effective because individuals' cultural background and personality characteristics may lead to different symptom manifestations. It seems that cognitive impairments and other somatic symptoms require more attention during the

assessment process because international survivors especially may experience or report relatively more somatic symptoms.

Not every person exposed to a traumatic event develops PTSD. Therefore, it is important to examine individual characteristics that might contribute to the development of PTSD. Mental health professionals may want to pay close attention to ruminative characteristics of survivors. This study showed that people with ruminative tendencies are more likely to develop PTSD for several reasons: they are more likely to focus on their negative moods; they are more likely to take pessimistic views; their unwanted thoughts are more likely to be intrusive when emotions are attached to them; and, they are less likely to express their trauma related thoughts and emotions. Rumination, therefore, exacerbates intrusive thoughts and intense emotional upheavals. Helping survivors to replace ruminative coping skill with more effective skills can help survivors.

In order to cope with intrusive thoughts and emotional upheavals, trauma survivors operate several emotion regulation strategies. However, not every type of emotion regulation facilitates the coping process. Suppression is one emotion regulation strategy and perhaps the most widely used. Even though suppression is utilized to cope with intrusive thoughts and emotions, it hinders the recovery from PTSD because it increases the likelihood of rebounding effects and consumes a substantial amount of cognitive resources. Recovery from trauma becomes even more difficult if people hold negative attitudes about their emotions. In particular, not being clear about emotions and being unable to repair negative moods increases the chance of maintaining PTSD over time. In this sense, it is important for mental health

professionals to help survivors to develop mindfulness about their emotional experiences and effective emotion regulation skills.

5.5 Limitations and Future Studies

This study has several limitations. First, the participants in the study were not recruited randomly. The results of this study rely on volunteer participants who may not necessarily represent the population of earthquake survivors. The earthquake survivors who refused to participate may differ in some important ways.

Furthermore, the results from the factor analyses needs to be validated with a larger sample size to create more stable results and be cross validated with different populations who were exposed to different types of trauma using different measures (other self-reports and structural interviews). The sample used for the factor analyses was limited in number and thus adult and children data were combined to increase the likelihood of obtaining stable results. Even though examining the adult and children samples in terms of their comparableness revealed no severe differences, the results of this present study should be confirmed with a larger sample.

This study carries the limitations of any study in which only self-report measures are used. Heppner, Kivilgan, and Wampold (1992) argue that self-reports are vulnerable to response bias. The participants of this study may have consciously or unconsciously chose to respond in a way that makes them appear more or less traumatized by the earthquake. For example, earthquake survivors were given material compensation or emotional support by the government or other aid organizations based on their loss.

This study is correlational in nature. The results obtained in this study indicate relations between the predictors and the criterion variable. The choices of variables

are in a sense arbitrary and thus causality cannot be established. There may be effects of some unmeasured variables to the development of PTSD such as other personality variables or availability of immediate and/or long-term social support systems for the survivors. It is possible that people may feel more comfortable expressing certain thoughts and feelings to certain people. Future longitudinal studies can provide greater certainty for understanding the development of PTSD and its relationship with risk/resiliency factors.

Finally, this study is a preliminary study that examines the diagnostic and developmental appearances of PTSD as a result of a natural disaster in an international sample. The basic premise for this study was that PTSD is both a universal and culture-bound construct (Marsella, Friedman, Gerrity, & Scurfield, 1996) and thus this study attempted to test the PTSD formulization for Turkish culture. Although the results of the study show that there are some variations in terms of symptom structures of PTSD, it does not give a clear picture in terms of where these differences are coming from. Also, the quantitative nature of the study does not allow clarification of the understanding of Turkish indigenous people's specific trauma experiences and their interpretation of these experiences. Specific responses were gathered for the specific questions asked. There may be some important questions that were not asked in this study. Therefore, future quantitative studies with in depth interviews may be more fruitful in terms of identifying culture specific symptoms and addressing the meaning of traumatic experiences itself.

Tables and Figures

Table 1: Fit Summaries for DSM-IV Model and Exploratory Models

	df	*S-B* χ^2	*S-B Diff*	*CFI*	*RMSEA*	*RCFI*	χ^2/df
DSM-Based Model							
1	104	875.3***	1603.1***	.611	.549	.624	8.42
2	101	350.8***	524.5***	.867	.093	.878	3.47
3	98	205.4***	-0.6	.942	.062	.948	2.10
Exploratory Model							
4	132	599.4***	2421.3***	.801	.110	.815	4.54
5	129	264.4***	335***	.920	.070	.946	2.05

Note. *** $p < .001$. *S-B* X^2 = Satorra-Bentler Chi-Square, *S-B Diff* = Difference between previous model and current model, indicates improvement in fit. CFI = Comparative Fit Index. *RSMEA* = Root Square Mean Error of Approximation. RCFI = Robust Comparative Fit Index.

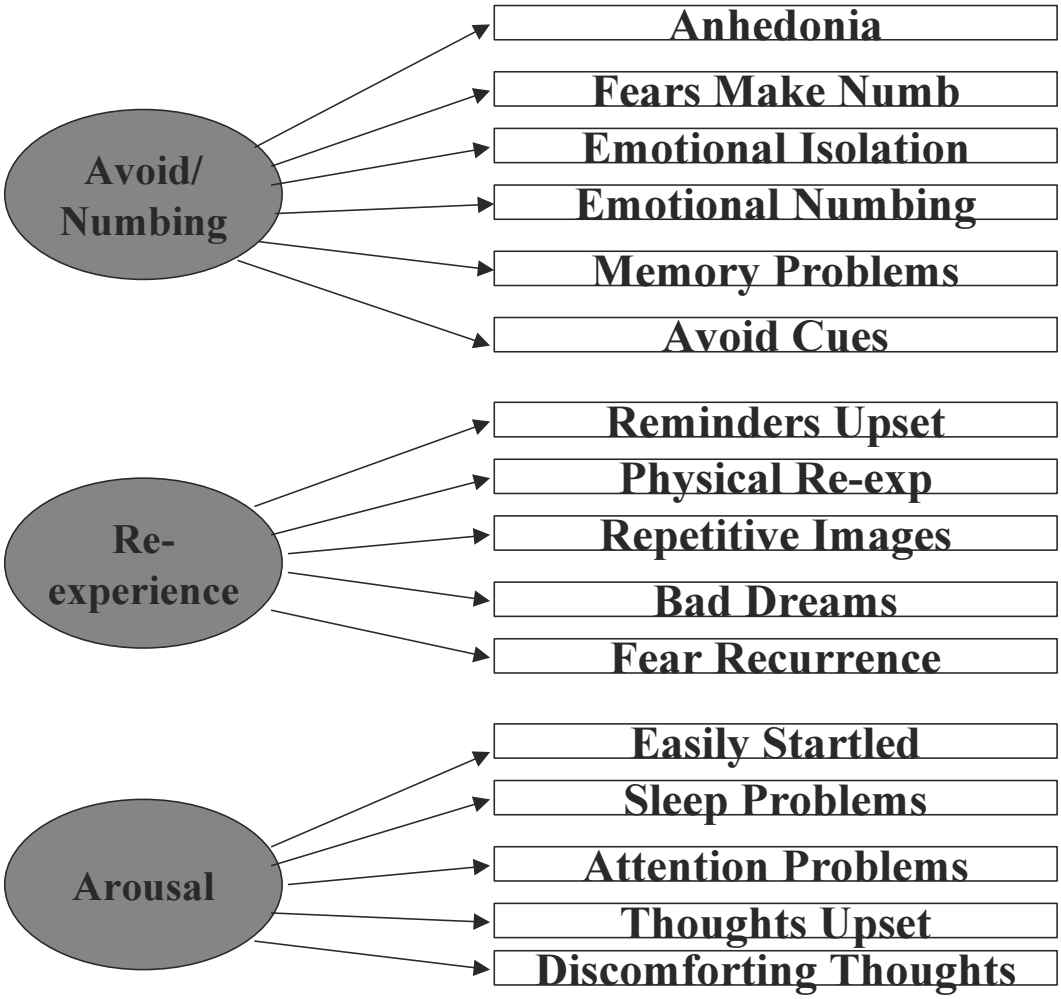

Figure 1: DSM-IV Model

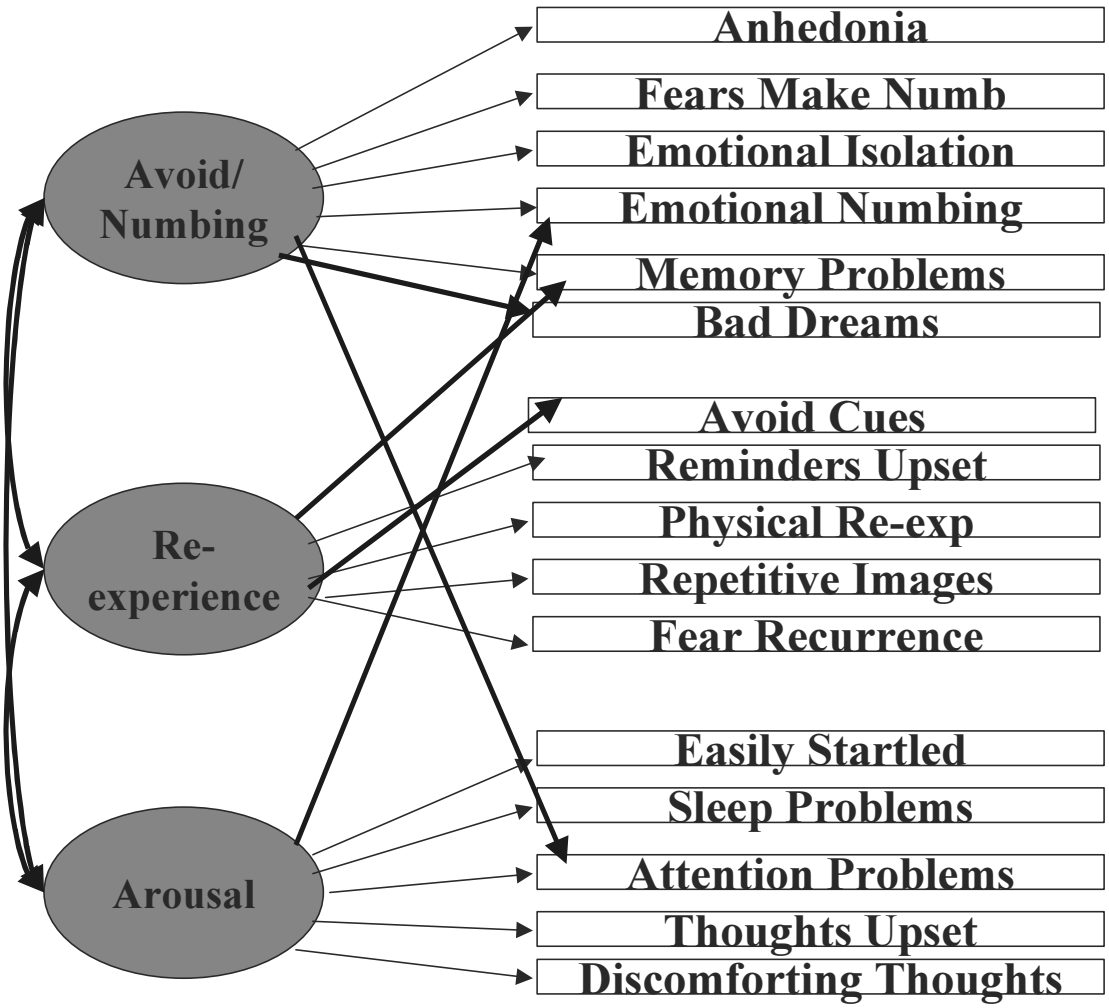

Figure 2. Final DSM-based Model

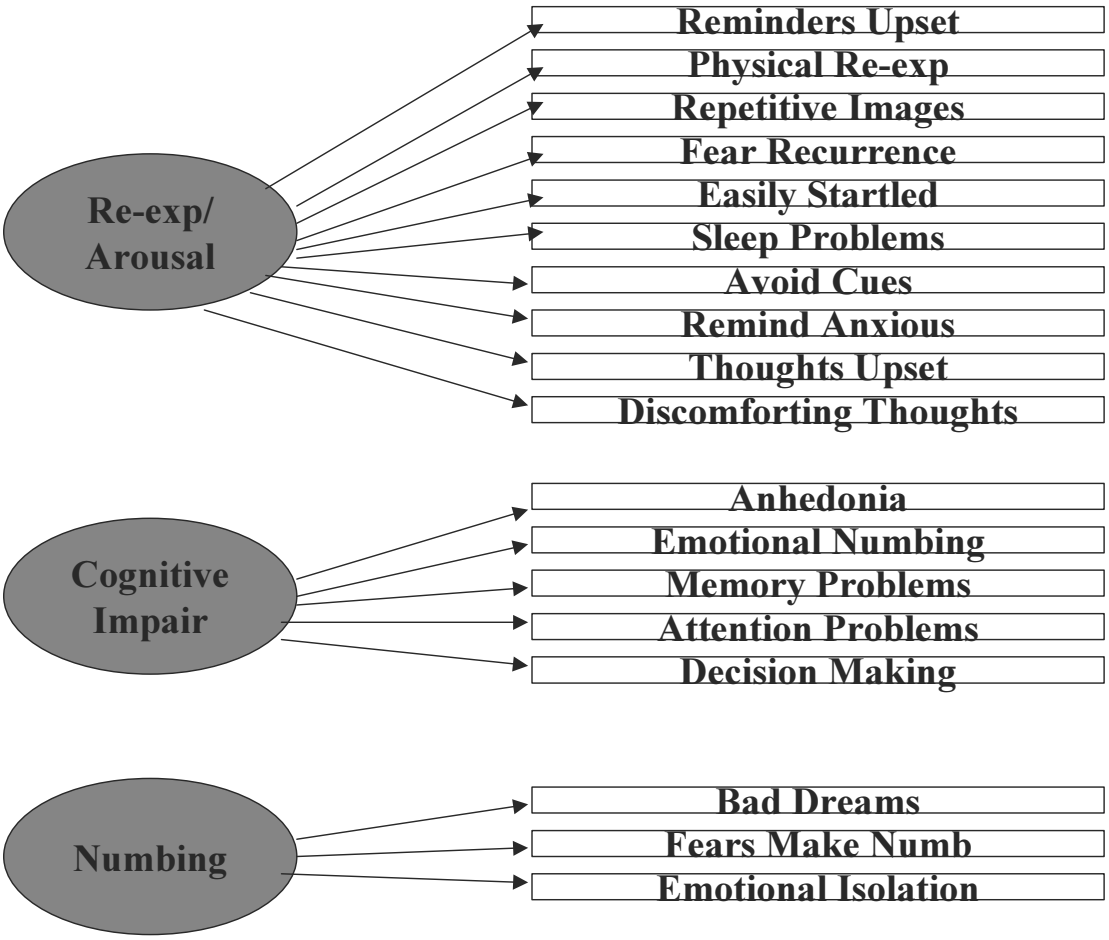

Figure 3: Initial Exploratory Model

Table 2: Exploratory Factor Analysis

	Component				
	1	2	3	Communality	M
I get really anxious when something reminds me about the earthquake	.78			.67	2.07
The earthquake makes me upset and nervous	.76			.66	1.84
I feel that the earthquake will happen again at any time	.74			.64	1.83
I feel upset or anxious when thinking about the earthquake	.72			.61	1.79
I reexperience disturbing scenes physically or emotionally	.61			.54	1.30
I feel alright when I think about the earthquake	-.59			.52	1.57
The earthquake is something that would upset most people	.58			.41	3.37
Thoughts about the earthquake come back to me even when I don't want them to	.58			.54	1.49
I want to stay away from things that make me remember what happened	.56			.33	2.12
I startle more easily or feel more jumpy or nervous	.54		.44	.56	1.55
I sleep well	-.51			.39	2.52
My memory is as good as it used to be		.81		.66	3.07
I can express my feelings just like I used to express them before the earthquake		.75		.58	2.89
My concentration is as good as it used to be		.75		.65	2.94
I can make good decisions		.65		.53	2.64
I feel as good about things before the earthquake		.49		.43	2.55
I feel alone and do not want to relate to anyone			.79	.68	0.53
Fears related to the earthquake make me numb			.70	.55	0.64
I have bad dreams about the earthquake or other bad dreams	.42		.46	.51	0.86
I feel guilty because I survived and did not work hard to save others				.21	0.61
Rotated Eigenvalue	5.09	3.26	2.33		
Rotated % variance explained	25.5	16.3	11.6		

Note. Values under .4 deleted.

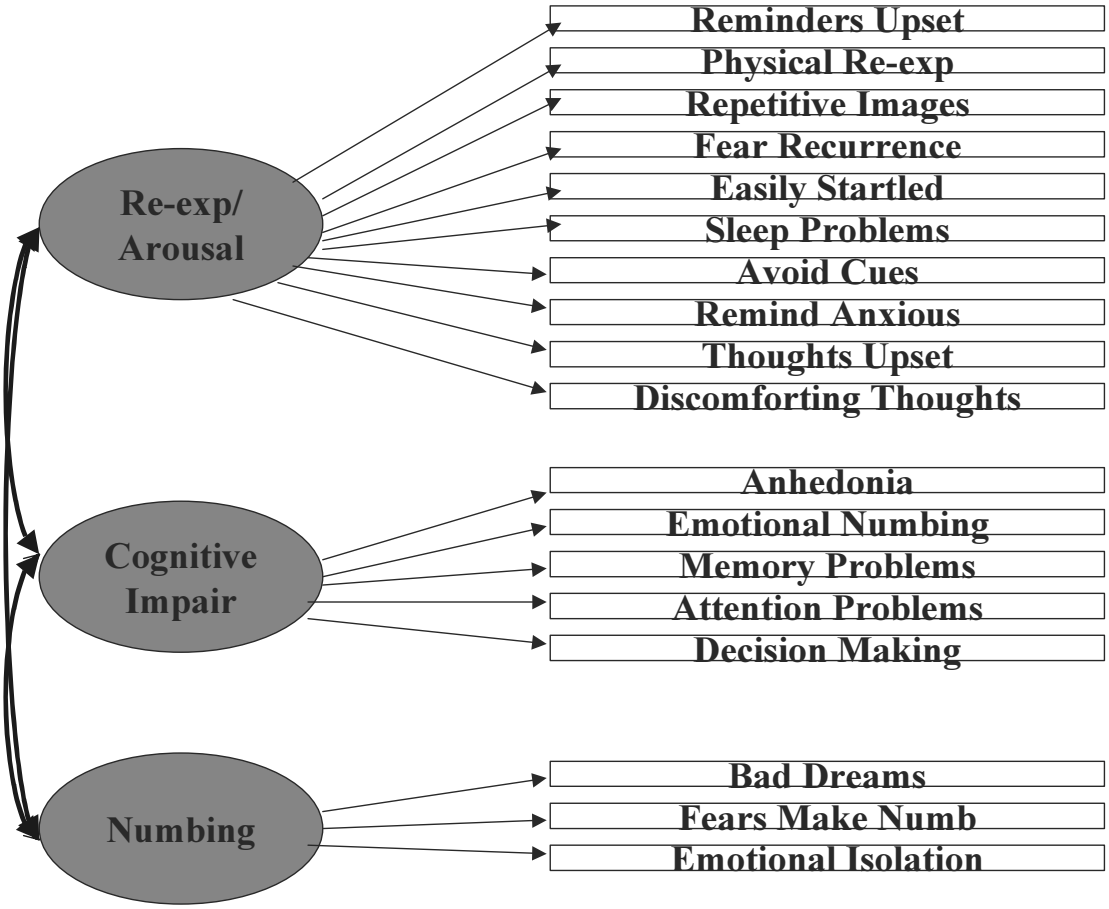

Figure 4. Final Exploratory Model

Table 3: Correlation Coefficients and Means and Standard Deviations for Predictors Variables

Variable	1	2	3	4	5	6	7	8	9	9a	9b	9c	10	10a	10b
1. Age	1														
2. Gender	-.046	1													
3. Marital Status	-.305**	-.066	1												
4. Number of Children	.666**	.025	-.429**	1											
5. Education Level	-.105	.102	.161	-.394**	1										
6. Economic Level	.274**	.042	-.065	.379**	-.452**	1									
7. Exposure Level	-.069	-.076	-.042	.071	-.333**	.236*	1								
8. Rumination	-.020	-.038	.023	.142	-.439**	.219*	.415**	1							
9. Meta-Mood Traits	-.012	-.231*	.038	-.038	.296**	-.285**	-.260*	-.311**	1						
9a. Attention	-.135	-.319**	.127	-.087	.241*	-.265*	-.181	-.067	.765**	1					
9b. Repair	.122	-.069	-.061	.059	.120	-.150	-.111	-.355**	.612**	.174	1				
9c. Clarity	.052	-.050	-.030	-.018	.250*	-.174	-.251*	-.327**	.753**	.274**	.377**	1			
10. Emotion Regulation	-.063	-.013	.133	.000	-.111	.061	.176	.176	.063	.104	.123	-.082	1		
10a. Reappraisal	-.040	-.083	.068	.023	-.106	.031	.136	.148	.143	.143	.117	.045	.816**	1	
10b. Supression	-.062	.055	.122	.015	-.196	.138	.256*	.336**	-.167	-.017	-.092	-.270**	.707**	.303**	1
M	31.09	1.46	1.48	1.98	3.20	3.07	20.01	47.69	141.22	60.37	28.15	52.67	49.78	31.24	12.61
SD	8.87	.50	.56	1.23	1.39	.86	4.53	11.42	20.70	11.98	6.88	9.69	9.72	6.06	4.38

Note: *N* s vary (minimum = 147, maximum = 157).

*$p < .05$ **$p < .01$

Table 4: Correlation Coefficients, Means and Standard Deviations for SCL-R and RIS

Variable	1	1a	1b	1c	1d	2	2a	2b	2c
1. SCL-R	1.000								
1a. Somatic	.864**	1.000							
1b. Depression	.917**	.674**	1.000						
1c. Anxiety	.795**	.561**	.666**	1.000					
1d. Hostility	.792**	.599**	.751**	.499**	1.000				
2. RIS	.696**	.553**	.617**	.696**	.534**	1.000			
2a. Reexperiencing	.650**	.502**	.553**	.702**	.476**	.930**	1.000		
2b. Cognitive Impairment	.465**	.366**	.435**	.449**	.378**	.736**	.505**	1.000	
2c. Numbing	.669**	.578**	.614**	.573**	.509**	.767**	.657**	.472**	1.000
M	127.93	35.63	39.03	24.22	20.74	37.73	15.5	8.21	78.35
SD	51.97	17.88	18.01	12.94	8.25	13.43	7.36	4.87	24.83

Note: *N* s vary (minimum = 153, maximum = 156).

*$p < .05$ **$p < .01$

Table 5: Correlation Matrix for Predictors and the SCL-R and RIS

		SCL-R Subscales					RIS Subscales		
Variable	SCL-R	Somatic	Depression	Anxiety	Hostility	RIS	Reexp.	Cognitive Impairment	Numbing
Age	.028	.126	-.016	-.015	-.047	-.006	-.029	.007	.031
Gender	-.236*	-.202	-.180	-.238*	-.227*	-.167	-.179	-.131	-.110
Marital Status	.005	.049	-.012	.041	-.100	-.086	-.077	-.106	-.040
Number of Children	.150	.235*	.069	.082	.108	.195	.140	.156	.242*
Education Level	-.380**	-.408**	-.271**	-.345**	-.310**	-.385**	-.322**	-.277**	-.457**
Economic Level	.230*	.203	.188	.262*	.121	.235*	.211*	.152	.286**
Exposure Level	.482**	.379**	.445**	.461**	.394**	.515**	.464**	.406**	.451**
Rumination	.661**	.555**	.640**	.466**	.599**	.575**	.493**	.383**	.622**
Meta-Mood Traits	-.357**	-.287**	-.312**	-.362**	-.276**	-.328**	-.260*	-.332**	-.326**
Attention	-.094	-.102	-.067	-.153	-.026	-.118	-.081	-.183	-.125
Repair	-.330**	-.269**	-.284**	-.224*	-.362**	-.298**	-.247*	-.267**	-.272**
Clarity	-.408**	-.293**	-.382**	-.424**	-.295**	-.341**	-.279**	-.294**	-.344**
Emotion Regulation	.167	.162	.123	.173	.077	.183	.201	.049	.206
Reappraisal	.165	.128	.142	.171	.116	.150	.194	.010	.199
Supression	.242*	.250*	.209*	.162	.161	.289**	.215*	.203	.301**

Note: *N* s vary (minimum = 151, maximum = 157).

*$p < .05$ **$p < .01$

Table 6: The Impact of Gender on PTSD[a]

Predictors	R^2 change	p	β	p
Step 1	.160	.0001		
# of children			.016	.857
Education level			-.349	.0001
Economic level			.083	.346
Step 2	.016	.093		
Gender			-.130	.093

Note: Adj. R^2 for final model = .153, F (4,143) = 7.6, p = .0001.
[a] Dependent Variable: RIS total Scale Score

Table 7: The Impact of Level of Exposure on PTSD[a]

Predictors	R^2 change	p	β	p
Step 1	.174	.0001		
# of children			.027	.759
Education level			-.323	.0001
Economic level			.086	.332
Gender			-.129	.099
Step 2	.168	.0001		
Level of exposure			.447	.0001

Note: Adj. R^2 for final model =.306, F (5,140) = 14.521, p = .0001

[a] Dependent Variable: RIS total Scale Score

Table 8: The Impact of Rumination on PTSD[a]

Predictors	R^2 change	p	β	p
Step 1	.172	.0001		
# of children			.371	.711
Education level			-.324	.0001
Economic level			.092	.307
Gender			.111	.156
Step 2	.211	.0001		
Rumination			.513	.0001

Note: Adj. R^2 for final model =.362, F (5,139) = 17.372, p = 0001

[a] Dependent Variable: RIS total Scale Score

Table 9: The Impact of Suppression on PTSD[a]

Predictors	R^2 change	p	β	p
Step 1	.169	.0001		
# of children			.022	.800
Education level			-.320	.001
Economic level			.094	.292
Gender			-.123	.114
Step 2	.045	.005		
Suppression			.220	.005

Note: Adj. R^2 for final model =.186, F (5,140) = 7.64, p = .0001

[a] Dependent Variable: RIS total Scale Score

Table 10: The Impact of Clarity on PTSD[a]

Predictors	R^2 change	p	β	p
Step 1	.183	.0001		
# of children			.037	.676
Education level			-.317	.001
Economic level			.093	.297
Gender			-.147	.064
Step 2	.211	.0001		
Clarity			-.29	.0001

Note: Adj. R^2 for final model =.234, F (5,135) = 9.56, p = .0001

[a] Dependent Variable: RIS total Scale Score

Table 11: The Impact of Mood Repair on PTSD[a]

Predictors	R^2 change	p	β	p
Step 1	.182	.0001		
# of children			.033	.706
Education level			-.317	.001
Economic level			.100	.259
Gender			-.142	.071
Step 2	.078	.0001		
Mood-repair			-.286	.0001

Note: Adj. R^2 for final model =.233, F (5,137) = 9.61, p = .0001

[a] Dependent Variable: RIS total Scale Score

Table 12: Summary of Research Findings: Hierarchical Regression Analyses

Predictors:	β	R^2 Change	P
Level of Exposure	.447	.168	.0001
Rumination	.513	.212	.0001
Repair	-.286	.078	.001
Clarity	-.289	.211	.0001
Suppression	.220	.045	.005
Gender	-.130	.016	.093

Criterion variable: The Reaction Index Scale

Appendix A

Turkish Questionnaires

1999 Depreminin Türk lnsanları Üzerindeki Etkileri

Yaşınız_____ Medeni durumuz_____

Cinsiyetiniz_____ Kaç çocuğunuz var?_____

Eğitim dereceniz: ilkokul____
Orta okul____
Lise____
Üniversite___
Master_____
Doktora____
Diğer (lütfen belirtiniz)_____

Ekonomik durumuz : çok iyi____ iyi_____orta_____ortanın altı_____kötü_____

Aşağıdaki soruları duygularınızı en iyi şekilde, aşağıdaki derecelendirme sistemini kullanarak yanıtlayınız: Eğer okuduğunuz cümle size hiç uymuyorsa 1, çok az uyuyor ise 2, biraz uyuyor ise 3, tam ortada ise 4, oldukça uyuyor ise 5, oldukca çok uyuyor ise 6 ve tamamen uyuyor ise 7 kullanınız. Sizi en iyi yansıtan sayıyı her cümlenin başindaki boşluğa yazınız.

1----------2----------3----------4----------5----------6----------7
Kesinlikle Bana Uymuyor, nötürüm Kesinlikle Bana uyuyor

---

1. ____ İnanıyorum ki, yaşadığım deprem birçok insanda ruhsal sorunlara neden olabilecek kadar sarsıcı idi.

2. ____ Deprem sırasında yaşadığım korkularım hala devam ediyor.

3. ____ Depremde beni fiziksel ve ruhsal olarak sarsan sahneleri tekrar tekrar yaşıyorum.

4. ____ Depremde yaşadıklarımla ilgili rahatsız edici düşünceler, onlardan kaçınmak için gösterdiğim tüm çabaya rağmen hiç aklımdan çıkmıyor.

5. ____ Deprem ile ilgili rüyalar peşimi bir türlü bırakmıyor.

6. ____ Her an, tekrar deprem olacakmış gibi şeyler düşünüyor ve hissediyorum.

7. ____ Depremden önce benim için önemli olan spor yapmak (futbol, basketbol gibi), kitap okumak, kağıt oynamak, sinemaya gitmek gibi uğraşılar ile şimdi de ilgileniyorum.

8. ____ Deprem ile ilgili korkular beni uyuşturdu; hiçbir şey hissedemez hale geldim.

9. ____ Deprem sonrasında, daha önce görüştüğüm insanlarla görüşmez hale geldim. Başkaları ile olan bütün ilişkilerimi kestim.

10. ____ Duygularımı depremden önceki kadar rahat ve özgürce ifade edebiliyorum.

11. ____ Depremden öncekine kıyasla çok daha kolay sinirleniyor ve ürküyorum.

12. ____ İyi uyuyorum.

13. ____ Olanları önlemek için daha fazla çaba göstermediğim ve başkalarından daha az acı çektiğim için kendimi kötü ve suçlu hissediyorum.

14. ____ Hafızam depremden önceki kadar iyi. (Olayları, isimleri vb. depremden önceki kadar iyi hatırlıyorum).

15. ____ Konsantrasyonum depremden önceki kadar iyi.

16. ____ Bana deprem anını hatırlatabilecek uğraşılardan kaçınıyorum.

17. ____ Depreme benzeyen ve depremi hatırlatan her durumda endişe ve sıkıntı duyuyorum.

18. ____ Depremle ilgili endişe, huzursuzluk, sıkıntı ve üzüntü duyguları taşıyorum.

19. ____ Depremi düşündüğümde rahatım ve endişe duymuyorum.

20. ____ Benim için herhangi bir konuda karar vermek depremden önceki kadar kolay.

<u>Aşağıdaki soruları EVET ya da HAYIR olarak yanıtlayınız..</u>

21. Endişe, sıkıntı ve üzüntü duygularınız depremden sonraki 6 ay içindemi başladı?

EVET HAYIR

22. 21.soruya yanıtınız EVET ise, son belirtiler olaydan sonraki 6 ay içinde geçti mi?

EVET HAYIR

23.Olaydan sonra endişe, sıkıntı, üzüntü belirtileriniz 6 aydan fazla sürdü mü?

EVET HAYIR

24.Olaydan 6 ay sonra ortaya çıkan endişe, korku, sıkıntı gibi belirtileriniz oldu mu?

EVET HAYIR

25. Deprem sonrası bir uzmanla görüştünüz mü veya profesyonel bir yardım aldınız mı?

EVET HAYIR

26. 25. soruya yanıtınız EVET ise, aldığınız yardımın aşağıdakilerden hangileri (birden fazla olabilir) olduğunu işaretleyiniz.

a) İlaç
b) Psikolojik yardım
c) Dini yardım
d) Sosyal yardım
e) Maddi yardım

Bu bölümde, size duygusallık ve duygularınızı nasıl kontrol ettiğiniz hakkında bazı sorular sormak istiyoruz. Özellikle duyğusallığın iki yönü üzerinde duruyoruz. İlki sizin <u>duygusal deneyiminiz</u>, başka bir deyişle neler hissettiğiniz. Diğeri ise duygusallığı konuşmanız, davranışlarınız ya da mimiklerinizle nasil ifade ettiğiniz. Genelde sorular birbirine çok benziyor gibi görünebilir ama özde birbirinden çok farklıdırlar. Lütfen her soruyu aşağıdaki derecelendirme sistemini kullanarak yanıtlayınız: Eğer okuduğunuz cümle size hiç uymuyorsa 1, çok az uyuyor ise 2, biraz uyuyor ise 3, tam ortada ise 4, oldukça uyuyor ise 5,

oldukca çok uyuyor ise 6 ve tamamen uyuyor ise 7 kullanınız. Sizi en iyi yansıtan sayıyı her cümlenin başindaki boşluğa yazınız.

1----------2----------3----------4----------5----------6----------7
Kesinlikle nötürüm Kesinlikle
Bana Uymuyor, <u>Bana</u> uyuyor

---

1. ____ Çoğu zaman duygularımı kontrol altında tutma eğilimindeyim.
2. ____ Kendimi *iyi hissettmek istedğim* zamanlarda, yani mutlu ve neşeli olmak istediğimde anlarda *düşüncelerimi değiştiririm*.
3. ____ Duygularımı başkasıyla paylaşmam, hep içimde saklarım.
4. ____ Kendimi *iyi hissetmediğim* zamanlarda yani üzüntülü ya da kızgın olduğum anlarda *düşüncelerimi değistirir*, farklı şeyler düşünürüm.
5. ____ Kendimi *iyi hissettiğim* zamanlarda, duygularımı saklamam.
6. ____ Stresli olduğum zamanlarda, kendimi neden stresli olduğum konuda *düşünmeye* zorlayarak sakinlesmeye çalışırım.
7. ____ Duygularımı *dışarıya vurmayarak* kontrol altına alıyorum.
8. ____ Kendimi *iyi hissettiğim* zamanlarda, beni etkileyen olaylar hakkındaki *düşüncelerim değişir.*
9. ____ Hiç bir zaman duygularımı kontrol altında tutmaya çalışmadım.
10. ____ İçinde bulunduğum durumu düşünüp anlamaya çalışarak duygularımı kontrol altında tutuyorum.
11. ____ Kendimi *iyi hissetmediğim* zamanlarda, duygularımı dışarıya yansıtmamaya özen gösteriyorum.
12. ____ Genelde duygularımı çok iyi kontrol ediyorum.
13. ____ Duygularımı kontrol etmek istediğim zamanlarda, beni etkileyen durum hakkındaki düşüncelerim pek değişmiyor.
14. ____ Kendimi iyi hissetmek istediğim zamanlarda beni etkileyen durum hakkındaki *düşüncelerim* değişiyor.

Yönerge: İnsanlar kötü bir deneyim yaşadıklarında bir sürü farklı şey yapar ya da düşünürler. Lütfen aşağıdaki cümleleri okuyup, son iki hafta içinde, belirtilenleri ne kadar sıklıkta yaptığınızı aşagidaki derecelendirme sistemini kullanarak yanıtlayınız. Size en iyi uyan sayıyı cümlelerin başlarindaki boşluklara yaziniz. Lütfen, ne yapmanız gerektiğini değil, gerçekte ne yaptığınızı belirtin.

1= Hiçbir Zaman 2=Bazen 3=Çoğunlukla 4= Neredeyse Her Zaman

1. ____ Kendini yalnız hissettiğini ne kadar sık düşünüyorsun?
2. ____ "Kendimi, hiç bir işimi yapamayacak kadar kötü hissediyorum" diye ne kadar sık düşünüyorsun?
3. ____ Ne kadar sık, yorgun ve ağrılarının olduğunu düşünüyorsun?
4. ____ Herhangi bir şeye konsantre olmanın zor olduğunu ne kadar sık düşünüyorsun?
5. ____ Pasif ve motivasyondan yoksun olduğunu ne kadar sık düşünüyorsun?
6. ____ Artık ne kadar duyarsızlaştığını ve hiçbir şey hissetmediğini ne kadar sık düşünüyorsun?
7. ____ Bir işe niye başlayıp devam ettiremediğini ne kadar düşünüyorsun?
8. ____ "Niye bu şekilde bir tepki gösteriyorum?" diye ne kadar sık düşünüyorsun?
9. ____ Yalnız başına bir yerlere gidip "Kendimi niye böyle hissediyorum" diye ne kadar sık düşünüyorsun?
10. ____ Ne kadar sık, düşüncelerini yazıp, çözümlemeye ve anlamaya çalışıyorsun?
11. ____ "Niye benim problemlerim var da, diğer insanların yok" diye ne kadar sık düşünüyorsun?
12. ____ Ne kadar sık, çok üzgün olduğunu düşünüyorsun?
13. ____ Bütün eksikliklerini, başarısızlıklarını ve hatalarını ne kadar sık düşünüyorsun?

14. ____ Hiçbir şey yapmak istemediğini ne kadar sık düşünüyorsun?

15. ____ Ne kadar sık, tek başına bir yere gidip duygularını anlamaya çalışıyorsun?

16. ____ Ne kadar sık, kendine kızgın olduğunu düşünüyorsun?

17. ____ Ne kadar sık, hüzünlü şarkılar dinliyorsun?

18. ____ Ne kadar sık, kendini insanlardan ayırıp, bir köşeye çekilip, neden üzgün olduğunu anlamaya çalışıyorsun?

19. ____ Ne kadar sık, hislerine yoğunlaşarak kendini anlamaya çalışıyorsun?

DEPREMIN YARATTIĞI OLUMSUZ ETKILER

1. Deprem, bulunduğunuz bölgeye ne kadar zarar verdi?

1= Hiç 2=Az 3=Orta derecede 4=Çok Fazla

2. Deprem sizin evinize ne kadar zarar verdi?

1= hiç 2=az 3=orta derecede 4=çok fazla

3. Depremde aile bireylerinizi veya yakın arkadaşlarınızı kaybetmekle ne kadar stres ve sıkıntı yaşadınız?

1= hiç 2=az 3=orta derecede 4=çok fazla

4. Aile bireylerinizin veya yakın arkadaşlarınızın depremde yaralanması size ne kadar stres ve de sıkıntı verdi?

1= hiç 2=az 3=orta derecede 4=çok fazla

5. Depremde kendinizin yaralanması size ne kadar stres, sıkıntı kaynağı oldu?

1= hiç 2=az 3=orta derecede 4=çok fazla

6. Deprem yüzünden günlük yaşamınız ne kadar zorlaştı?

1= hiç 2=az 3=orta derecede 4=çok fazla

Size zaman zaman herkese olabilecek bazı şikayetlerden bahsedeceğim. Lütfen dikkatle okuyunuz ve bunun size de *son onbeş gün içerisinde* olup olmadığını belirtiniz.

1----------2----------3----------4----------5----------6----------7

Kesinlikle Bana Uymuyor, **nötürüm** **Kesinlikle Bana uyuyor**

---

1. _____ Başağrısı
2. _____ Sinirlilik ya da gerginlik
3. _____ Baş dönmesi ya da baygınlık hali
4. _____ Kolayca kızma ya da sinirlenme
5. _____ Göğğüs ya da kalp bölgesinde ağrılar
6. _____ Sokaklarda veya açık alanlarda korku hissi
7. _____ Halsizlik
8. _____ Yaşamınıza son verme düşünceleri
9. _____ Depremle ilgili düşünce veya hayaller
10. _____ İştahınızda azalma
11. _____ Kolayca ağlama
12. _____ Kapalı yerlerde korkuya kapılma
13. _____ Bir neden olmaksızın aniden korkuya kapılma
14. _____ Kontrol edemediğiniz öfkelenmeler
15. _____ Evde yanlız kalmaktan korkma
16. _____ Olanlardan dolayı kendinizi suçlama
17. _____ Bel ağrısı
18. _____ Yalnızlık duygusu
19. _____ Karamsarlık
20. _____ Herşey için endişelenme
21. _____ Herşeye karşı ilgisizlik

22. _____ Kalp çarpıntısı
23. _____ Bulantı ya da midenizde rahatsızlık
24. _____ Adele (kas) ağrıları
25. _____ Uykuya dalmada güçlük, rahat uyuyamama
26. _____ Otobüs, tren gibi araçlarla yolculuk etme korkusu
27. _____ Nefes almada güçlük
28. _____ Sizi korkutan yerlerden / şeylerden kaçınma
29. _____ Bedeninizin bazı yerlerinde uyuşma, karıncalanma olması
30. _____ Boğazınıza birşey tıkanma hissi
31. _____ Gelecek konusunda umutsuzluk
32. _____ Ölüm veya ölüm düşünceleri
33. _____ Aşırı yemek yeme
34. _____ Sabah çok erken saatte isteğiniz dışında uyanma
35. _____ Çarşı, pazar gibi yerlerde rahatsızlık duyma
36. _____ Her işin bir yük gibi görünmesi
37. _____ Sık sık tartışmaya girme
38. _____ Başınıza kötü birşey gelecekmiş duygusu
39. _____ Korkutucu düşünce ve hayallere kapılma
40. _____ Yerinizde duramayacak ölçüde huzursuzluk hissi.

Bu bölümde genel olarak insanların duyguları hakkında ne hissettikleri ve düşündüklerini anlamaya çalışıyoruz. Lütfen her cümleyi okuyup, bu cümleye ne kadar katılıp katılmadığınızı aşağidaki dereceleme sistemini kullanarak belirtiniz.

1----------2----------3----------4----------5----------6----------7		
Kesinlikle Bana Uymuyor,	**nötürüm**	**Kesinlikle <u>Bana</u> uyuyor**

1. _____ Duygular hayatı yönlendirir.
2. _____ Ne kadar kötü hissedersem edeyim iyi şeyler düşünmeye çalışırım.
3. _____ Genellikle ne hissettiğim konusunda karar verememem.
4. _____ lnsanlar daha çok düşünüp daha az hissetseler onlar için daha iyi olur.
5. _____ Üzgün olduğumda kendime hayattaki güzellikleri hatırlatırım.
6. _____ Asla neler hissettiğimi söyleyemem.
7. _____ Bazen neler hissettiğimi ifade edemem.
8. _____ Hemen hemen her zaman ne hissttigimi tam olarak bilirim.
9. _____ Bazen mutlu olmama rağmen çoğunlukla dışardan kötümsermişim gibi görünürüm.
10. _____ Çoğunlukla ne hissettiğimi çok iyi bilirim.
11. _____ Kendimi ne kadar kötü hissedersem edeyim, güzel şeyler düşünmeye çalışırım.
12. _____ Ne hissettiğim konusunda karar veremediğim anlar çok nadirdir.
13. _____ Duygularıma bir anlam veremem.
14. _____ Bazen üzgün olmama rağmen, çoğunlukla dışardan iyimser görünürüm.
15. _____ Duygular hakkında düşünmek genellikle zaman kaybıdır.
16. _____ Üzgün olduğumda, hayattaki güzel şeylerin bir yalan olduğunu düşünürüm.
17. _____ Duygular insanların zayıf yönleridir.
18. _____ Sık sık duygularım hakkında düşünürüm.
19. _____ Genellikle olaylar hakkındaki duygularımın farkındayımdır.
20. _____ Neler hissettiğimi genellikle umursamam.

21. _____ Benim için duygularım ile başa çıkmanın en kolay yolu onları dolu dolu yaşamaktır.
22. _____ O an neler hissettiğime bağlı olarak inanç ve düşüncelerim değişir.
23. _____ Duygularım konusunda rahatımdır.
24. _____ Asla duygularımın esiri olmam.
25. _____ Genellikle herhangi bir konu hakkındaki duygularımı bilirim.
26. _____ Duygular ınsanları yönlendirmemeli.
27. _____ Nasıl hissettiğime çok önem veririm.
28. _____ Duygularıma pek dikkat etmem.
29. _____ lnsanların kalplerinden geçtiği gibi davranmaları gerektiğine inanırım.
30. _____ Bence duygularına yada içinde bulunduğun ruh haline kafa yormaya değmez.

Verdiğiniz hiç bir bilgi, hiç bir şekilde bir başkası ile paylaşılmayacaktır. Araştırmanın sonuçları değerlendirilirken hiç bir isim yada tanınmanıza neden olabilecek bilgi kullanılmayacaktır. Katıldığınız için çok teşekkürler.

Appendix B

English Versions of Questionnaires

Reaction Index Scale

Please answer each question by indicating a number from 1 to 7 that describes your feelings best based on the scale below. Please be sure to answer all questions.

1----------2----------3----------4----------5----------6----------7
strongly disagree **neutral** **strongly agree**

---

1. ___I believe that the earthquake was an extreme stressor that would cause psychological problems to most people.

2. ___Fears related to earthquake continue to occupy my mind.

3. ___I reexperience disturbing scenes about the earthquake either physically or emotionally.

4. ___Uncomfortable thoughts about my experiences in the earthquake seem to invade my mind in spite of efforts to keep it out.

5. ___Dreams about my earthquake experiences keep coming back.

6. ___I see or think of many things that make me feel as if my earthquake experiences are about to happen again.

7. ___I keep interesting activities that were important before the earthquake experience, such as sports, e.g., bowling, going to football games, etc…

8. ___Fears about earthquakes have left me numb.

9. ___I am now more detached and less involved with other people than I was before the earthquake.

10.___I express emotions and feelings as freely as I did before the earthquake.

11. ___I seem jumpy, edgy, and more easily startled than before the earthquake.

12. ___I sleep well.

13. ___I feel bad or guilty that I didn't do more to try to prevent what happened or went through less than others.

14. ___I remember things as well as I did before the earthquake.

15. ___My concentration is as good as it was before the earthquake.

16. ___I tend to avoid activities, which might make me remember my experience of the earthquake.

17. ___When something resembles the earthquake or reminds me of the earthquake, feelings of distress increase in me.

18. ___Feelings of distress about the earthquake occur.

19. ___I am relaxed and without tension when I think of the earthquake.

20. ___It is as easy for me to make decisions as it was before the earthquake.

Emotion Regulation Questionnaire (ERQ)

J. Gross & O. John

Version October 3, 2000

In this section, we would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. We are interested in two aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

1----------2----------3----------4----------5----------6----------7

strongly disagree **neutral** **strongly agree**

---

1. ____ I tend to control my emotions most of the time.
2. ____ When I want to feel more *positive* emotion (such as joy or amusement), I *change what I'm thinking about*.
3. ____ I keep my emotions to myself.
4. ____ When I want to feel less *negative* emotion (such as sadness or anger), I *change what I'm thinking about*.
5. ____ When I am feeling *positive* emotions, I am careful not to express them.
6. ____ When I'm faced with a stressful situation, I make myself *think about it* in a way that helps me stay calm.
7. ____ I control my emotions by *not expressing them*.
8. ____ When I want to feel more *positive* emotion, I *change the way I'm thinking* about the situation.
9. ____ I almost never try to inhibit my emotional expressions.
10. ____ I control my emotions by *changing the way I think* about the situation I'm in.
11. ____ When I am feeling *negative* emotions, I make sure not to express them.
12. ____ Overall, I have a great deal of control over my emotions.

13. ____ When I want to control my emotions, I'm not likely to *change the way I think about the situation.*

14. ____ When I want to feel less *negative* emotion, I *change the way I'm thinking* about the situation.

Level of Exposure

Please answer each question by indicating a number from 1 to 7 that describes your feelings best based on the scale below. Please be sure to answer all questions.

1----------2----------3----------4----------5----------6----------7
strongly disagree **neutral** **strongly agree**

1___How much damage did the earthquake cause to the area where you were when the earthquake happened?

2___How much damage did the earthquake cause to your house?

3___How much stress did you experience by losing family members and/or close friends during the earthquake?

4___How much stress did you experience because your family members and/or close friends were injured by the earthquake?

5___How much stress did you experience because you were injured by the earthquake?

6___How much of your daily life has been inconvenienced as a result of earthquake?

Rumination Questionnaire

Instructions: People think and do many different things when they have experienced the loss of a close relationship. Please read each of the items below and indicate how often, within the past 2 weeks, you have thought or done each one. Please indicate what you generally have done, not what you think you should do.

1=Almost Never 2=Sometimes 3=Often 4=Almost Always

1____Think about how alone you feel.

2____Think, "I won't be able to do my job/work because I feel so badly.

3____Think about your feelings of fatigue and achiness

4____Think about how hard it is to concentrate

5____Think about hoe passive and unmotivated you feel

6____Analyze recent events to try and understand why the relationship ended

7____Think about how you don't seem to feel anything anymore

8____Think, "Why can't I get going?"

9____Think, "Why am I reacting this way?"

10____Go away by yourself and think why you feel this way

11____Write down what you are thinking about and analyze it.

12____Think, about the relationship, wishing it would not have ended.

13____Think, "Why do I have problems other people don't have?"

14____Think about how sad you feel

15____Think about all your shortcomings, failings, faults, mistakes

16____Think about how you don't feel up to doing anything

17____Analyze your personality to try to understand why he/she left you

18____Go someplace alone to think about your feelings

19____Think about how angry you are with yourself

20. ____Listen to sad music

21. ____Isolate yourself and think about reasons why you feel sad

22. ____Try to understand yourself by focusing on your feelings

Trait Meta-Mood Scale

Instructions: We are interested in finding out what people feel and think about their emotions in general. Please read each statement and decide whether or not you agree with it and indicate a number from 1 to 7 that describes you best based on the scale below.

1----------2----------3----------4----------5----------6----------7
strongly disagree **neutral** **strongly agree**

1.___Feelings give direction to life.

2.___I try to think good thoughts no matter how badly I feel.

3___I am usually confused about how I feel.

4___People would be better off if they felt less and thought more.

5___When I become upset I remind myself of all the pleasures in life.

6___I can never tell how I feel.

7___Sometimes I can't tell what my feelings are.

8___I almost always know exactly how I am feeling.

9___Although I am sometimes happy, I have a mostly pessimistic outlook.

10___I am usually very clear about my feelings.

11___No matter how badly I feel, I try to think about pleasant things.

12___I am rarely confused about how I feel.

13___I can't make sense out of my feelings.

14___Although I am sometimes sad, I have a mostly optimistic outlook.

15___It is usually a waste of time to think about your emotions.

16___When I am upset I realized that the good things in life are illusions.

17___Feelings are a weakness humans have.

18___I often think about my feelings.

19___I am often aware of my feelings on a matter.

20___I do not usually care much about what I am feeling.

21___The best way for me to handle my feelings is to experience them to the fullest.

22___My belief and opinions always seem to change depending on how I feel.

23___I feel at ease about my emotions.

24___I never give into my emotions.

25___I usually know my feelings about a matter.

26___One should never be guided by emotions.

27___I pay a lot of attention to how I feel.

28___I do not pay much attention to my feelings.

29___I believe in acting from the heart.

30___I do not think it is worth paying attention to your emotions or your moods.

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